Scientific Opinion of the Panel on food additives, flavourings, processing aids and materials in contact with food (AFC) on a request related to

a 16th list of substances for food contact materials


Adopted on 25-26 September 2007

SCIENTIFIC PANEL MEMBERS


SUMMARY

Within the general task of evaluating substances intended for use in materials in contact with food according to the Regulation (EC) No.1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with foodstuffs, the AFC Panel evaluated the following substances:

Ref. No.: 34130  
Name of the substance: Alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines  
CAS number: -  
Classified in list: 2  
Restriction: TDI = 0.5 mg/kg bw

Ref. No.: 37520  
Name of the substance: 1,2-Benzisothiazolin-3-one  
CAS number: 002634-33-5
<table>
<thead>
<tr>
<th>Classified in list:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restriction:</td>
<td>0.5 mg/kg food</td>
</tr>
<tr>
<td>Ref. No.:</td>
<td>39815</td>
</tr>
<tr>
<td>Name of the substance:</td>
<td>9,9-Bis(methoxymethyl)fluorene</td>
</tr>
<tr>
<td>CAS number:</td>
<td>182121-12-6</td>
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<tr>
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<td>3</td>
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<td>Restriction:</td>
<td>0.05 mg/kg food</td>
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<td>Ref. No.:</td>
<td>45703</td>
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<tr>
<td>Name of the substance:</td>
<td>cis-1,2-Cyclohexanedicarboxylic acid, calcium salt</td>
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<tr>
<td>CAS number:</td>
<td>491589-22-1</td>
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<tr>
<td>Classified in list:</td>
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<tr>
<td>Restriction:</td>
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<td>Name of the substance:</td>
<td>2-Methyl-4-isothiazolin-3-one</td>
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<td>CAS number:</td>
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<td>Restriction:</td>
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<td>Ref. No.:</td>
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<td>Name of the substance:</td>
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<td>Ref. No.:</td>
<td>76723</td>
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<td>Name of the substance:</td>
<td>Polymethylsiloxane, 3-aminopropyl terminated, polymer with dicyclopentenylmethane-4,4'-diisocyanate</td>
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<td>Restriction:</td>
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<tr>
<td>Ref. No.:</td>
<td>76725</td>
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<tr>
<td>Name of the substance:</td>
<td>Polymethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane</td>
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<td>CAS number:</td>
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<td>Restriction:</td>
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<tr>
<td>Ref. No.:</td>
<td>86430</td>
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<tr>
<td>Name of the substance:</td>
<td>Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)</td>
</tr>
<tr>
<td>CAS number:</td>
<td>TiO₂: 013463-67-7</td>
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</tbody>
</table>
KEYWORDS

Food Contact Materials, Plastics, Monomers, Additives, REF. No 34130, Alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines, REF. No 37520, CAS No. 002634-33-5, 1,2-Benzenothiazolin-3-one, REF. No 39815, CAS No. 182121-12-6, 9,9-Bis(methoxymethyl)fluorene, REF. No 45703, CAS No. 491589-22-1, cis-1,2-Cyclohexanedicarboxylic acid, calcium salt, REF. No 66755, CAS No. 2682-20-4, 2-Methyl-4-isothiazolin-3-one, REF. No 76463, CAS No. 9003-04-7, Polyacrylic acid, sodium salt, REF. No 76723, CAS. No 167883-16-1, Polydimethylsiloxane, 3-aminopropyl terminated, polymer with dicyclohexylmethane-4,4’-diisocyanate, REF No 76725, CAS. No 661476-41-1, Polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane, REF. No 86430, CAS No. TiO2: 013463-67-7, AgCl: 007783-90-6, Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w).

BACKGROUND

Before a substance is authorised to be used in food contact materials and is included in a positive list EFSA’s opinion on its safety is required. This procedure has been established in Articles 8 and 9 of the Regulation (EC) No. 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food1.

TERMS OF REFERENCE

The EFSA is required by Article 10 of Regulation (EC) No. 1935/2004 of the European Parliament and of the Council on materials and articles intended to come into contact with food to carry out risk assessments on the risks originating from the migration of substances from food contact materials into food and deliver a scientific opinion on:

1. new substances intended to be used in food contact materials before their authorisation and inclusion in a positive list;
2. substances which are already authorised in the framework of Regulation (EC) No. 1935/2004 but need to be re-evaluated.

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ACKNOWLEDGEMENTS

The European Food Safety Authority wishes to thank Herman Autrup, Mona-Lise Binderup, Laurence Castle, Riccardo Crebelli, Wolfgang Dekant, Nathalie Gontard, Roland Franz, Eugenia Lampi, Jean-Claude Lhuguenot, François Xavier Malcata, Maria Rosaria Milana, A. Mortensen, Bevan Moseley, A. K. Müller, C. Nellemann, Karla Pfaff, S Rossi, T.G. Siere, A.A.M. Stolker, Paul Tobback, Detlef Wölfle and Esther Zondervan-van den Beuken*, for their contribution to the draft opinion.

* Wolfgang Dekant, member of the Panel, declared an interest for the substances REF. No. 76723 and 76725 and therefore he did not participate in the discussion on these substances.
Sandro Grilli, member of the Panel, declared an interest for the substance REF. No. 66755, 2-Methyl-4-isothiazolin-3-one and therefore he did not participate in the discussion on this substance.
Esther Zondervan-van den Beuken, expert of the working group declared an interest for the substance REF. No. 39815, 9,9-Bis(methoxymethyl)fluorene, and therefore she did not participate in the discussion on this substance in the working group.
Details on the declarations of interest can be found in the minutes of the Panel meeting at:
ASSESSMENT

Within this general task the Scientific Panel on food additives, flavourings, processing aids and materials in contact with food (AFC) evaluated the following substances used in food contact materials.

The substances examined are listed in ascending order of their Reference Number (REF No.), with their chemical name, Chemical Abstract Number (CAS No.) and classification according to the “SCF list”. (Since in the past the evaluation of substances used in food contact materials was undertaken by the Scientific Committee on Food (SCF), the same system of classification into a “SCF list” is retained for uniformity purposes). The definitions of the various SCF lists and the abbreviations used are given in the appendix.

The studies submitted for evaluation followed the SCF guidelines for the presentation of an application for safety assessment of a substance to be used in food contact materials prior to its authorisation (http://ec.europa.eu/food/fs/sc/scf/out82_en.pdf)

<table>
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<td>Name of the substance:</td>
<td>Alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines</td>
</tr>
</tbody>
</table>

**General information:**

According to the petitioner, alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines are intended to be used as detergents, dyeing auxiliaries, wetting agents and antistatic agents in plastics intended to come into contact with all types of foodstuffs. Maximum percentage in formulation is 0.01% w/w.

**Previous evaluations (by SCF or AFC):**

None (new substance)

**Available data used for this evaluation:**

- Data on identity
- Data on physical and chemical properties
- Data on use and authorisation
- Data on migration
- Data on residual content of the substance

**Toxicity data**

- Gene mutation in bacteria
- *In vitro* chromosomal aberrations in cultured mammalian cells
- *In vitro* gene mutation in cultured mammalian cells
- Conclusions on chronic toxicity based on results of 2 year oral
Ref. No.: 34130
Name of the substance: Alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines

- Toxicity study with metabolite of compound covered by the application
- Reproduction / developmental toxicity
- 28-day oral toxicity study
- Absorption, distribution, biotransformation and excretion of a metabolite of the compound covered by the application

Evaluation:

Solubility of alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines in olive oil, 95% ethanol and isooctane is > 100 g/L, and in water 10 mg/L. The migration of the sum of the substances from low density polyethylene (LDPE) and plasticized polyvinylchloride (PVC) containing 0.01% alkyl, linear with even number of carbon atoms (C12-C20) dimethylamines was determined after a contact period of 10 days at 40°C and of 2 hours at 70°C in 3% acetic acid, 10% ethanol, 95% ethanol and isooctane. The highest migration value was 0.6 mg/kg in 95% ethanol (10 days at 40°C). In 3% acetic acid and 10% ethanol the migration was 0.25 and 0.06 mg/kg respectively.

Dodecyldimethylamine, a compound representative of the mixture of the substances, as well as the mixture itself covered by the application were negative in bacterial and mammalian cell mutagenicity assays and in an in vivo micronucleus test. Therefore, the compounds are considered as non-genotoxic. A 28-day repeated-dose toxicity study with dodecyldimethylamine in rats resulted in a NOAEL of 50 mg/kg bw. Due to the irritating effects of alkylidimethyl amines, higher doses resulted in local toxicity to the gastrointestinal tract and death. For assessment of toxicity after chronic administration, the results of a 2-year feeding study with dodecyldimethylamine oxide can be used. The amine oxide is readily reduced to dodecyldimethylamine in the organism. Due to the rapid conversion, it can be assumed that both compounds have a similar toxicity profile in animals. The NOAEL for dodecyldimethylamine oxide was 50 mg/kg bw/day. A NOAEL of 50 mg/kg bw/day was also observed in a reproductive toxicity study with dodecyldimethylamine. Alkylidimethylamines and their N-oxides are rapidly absorbed from the gastrointestinal tract, rapidly metabolised and rapidly excreted suggesting absence of a potential for accumulation in man.

Considering the dataset provided for the substance the Panel concluded that a TDI of 0.5 mg/kg bw can be derived by applying the default safety factor of 100 to the NOAEL of 50 mg/kg bw/day.
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</tbody>
</table>

**Conclusion:**

Based on the above-mentioned data the substance is classified:

<table>
<thead>
<tr>
<th>SCF List:</th>
<th>2</th>
</tr>
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<tbody>
<tr>
<td>Restriction:</td>
<td>TDI = 0.5 mg/kg bw</td>
</tr>
</tbody>
</table>

**Remark for Commission:**

None

<table>
<thead>
<tr>
<th>Needed data or information</th>
</tr>
</thead>
</table>

**References:**

- Unpublished data submitted by the petitioner on 30-01-2007

<table>
<thead>
<tr>
<th>Ref. No.:</th>
<th>37520</th>
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<tbody>
<tr>
<td>Name of the substance:</td>
<td>1,2-Benzisothiazolin-3-one</td>
</tr>
<tr>
<td>CAS number:</td>
<td>002634-33-5</td>
</tr>
</tbody>
</table>

**General information:**

According to the petitioner, 1,2-benzisothiazolin-3-one is a biocide intended to be used as a preservative of water based polymer dispersions used to make coatings. In this application it is used in combination with 2-methyl-4-isothiazolin-3-one (REF No. 66755). The substance may be present at a maximum of 0.02% w/w in the dry coating. 1,2-benzisothiazolin-3-one is also used as a slimicide in the manufacture of paper.

**Previous evaluations (by SCF or AFC):**

The substance was first evaluated by the SCF in 1980 (SCF, 1992) and classified in SCF List 2 with a t-TDI of 0.02 mg/kg b.w. Available data: several oral dog studies and a 90-d oral rat study. Needed data: mutagenicity studies.
**Ref. No.:** 37520  
**Name of the substance:** 1,2-Benzisothiazolin-3-one

The substance was also evaluated by the EFSA in 2006 (EFSA, 2006) as an impurity in saccharin used as a food additive.

### Available data used for this evaluation:

**Non-toxicity data:**
- Data on identity and physical and chemical properties
- Data on intended use and authorisation
- Calculation of worst case migration from coated paper on the basis of the maximum use level
- Data on decomposition
- Data on actual content in dry coating and aqueous dispersion

**Microbiological data:**
- Data on intended microbiological function
- Data on level of activity
- Data on the lack of microbial inhibition in the finished food contact material

**Toxicity data**
- Gene mutation in bacteria
  - *In vitro* mammalian cell gene mutation test
  - *In vitro* mammalian chromosome aberration test
  - *In vivo* micronucleus test
  - *In vivo* unscheduled DNA synthesis (UDS)
- 90-day oral toxicity study
- 28-day oral toxicity study

### Evaluation:

A validated analytical method for the determination of the specific migration of 1,2-benzisothiazolin-3-one into food simulants has been provided. Olive oil was not a suitable test medium, due to a slow degradation of 1,2-benzisothiazolin-3-one over 10 days at 40°C attributed to reactions with peroxides. Substitute test media, 95% ethanol and isooctane, were used.

A worst case calculation of the migration of the substance from a coated paper sample resulted in a value of 0.3 mg/kg food.

Two tests have been performed to demonstrate that a combination of 1,2-benzisothiazolin-3-one (BIT) and 2-methyl-4-isothiazolin-3-one (MIT) each used at a maximum concentration of 0.01% in polymer dispersions/aqueous emulsions does not exhibit any antimicrobial activity in a manufactured coated paper or board in contact with food. The concentration used corresponds to 0.02% BIT and 0.02% MIT in the dry coating for a solid content of 50% in
1,2-Benzisothiazolin-3-one
delivered to the dispersions/emulsions.

The coated papers did not show antimicrobial activity against *Staphylococcus aureus* or *Escherichia coli* using the film test.
The same coated papers tested for antimicrobial activity against *Bacillus subtilis* and *Aspergillus niger* spores using a second
standard test also showed no antimicrobial activity.

BIT was not mutagenic in a bacterial reversion test. However, due
to toxicity against the bacterial tester strains no firm conclusions
can be made of the mutagenic potential of BIT in bacteria.
Regarding the mutagenic potential of BIT in mammalian cells *in vitro*, the test result was negative. BIT induced chromosome
aberrations *in vitro*. However, *in vivo* no clastogenic effect was
observed in a micronucleus test in bone marrow with evidence of
target cells exposure and no increase in DNA repair as a response to
DNA damage was observed in an UDS test in rat hepatocytes.
Therefore, although BIT shows clastogenic activity *in vitro*, two
adequately performed *in vivo* tests in two different tissues provide
no evidence for a genotoxic potential of BIT *in vivo*.
BIT was tested in a 90-day oral toxicity study. The no observed
adverse effect level based on histological changes in the non-
glandular stomach was 8.42 mg BIT/kg b.w./day. Except for slight
salivation and decreased body weights in the high dose groups, no
other treatment related effects were observed. Similar findings were
obtained in a 28-day oral toxicity study.
The Log P<sub>o/w</sub> = 0.7 (pH7, 20°C). Therefore BIT is not considered to
have accumulative potential in man.

Although some other isothiazolines are known to be dermal
sensitisers, BIT has rarely been reported to cause sensitisation.
The Panel considers that low dose BIT exposure via the oral route is
unlikely to result in sensitisation given the rarity of allergic
reactions to BIT and the limited ability of the systemic route to elicit
reactions. The Panel concludes dermal sensitisation is not relevant
to the assessment of consumer exposure to BIT present in food
contact articles.

Based on worst case migration potential and the NOAEL from the
90-day study, the Panel considers a restriction of 0.5 mg/kg food
would be appropriate. This would give a large margin of safety.

From the data available there is no indication for induction of gene
Ref. No.: 37520
Name of the substance: 1,2-Benzisothiazolin-3-one

mutations in bacteria. Additionally there is a lack of antimicrobial activity at the surface of the coated papers. This is considered to preclude the emergence of an antimicrobial-resistant population. Therefore, in the light of the current knowledge and considering the proposed use, there is no basis for concern for induction of antimicrobial resistance.

Conclusion: Based on the above-mentioned data the substance is classified:
SCF_List: 3
Restriction: 0.5 mg/kg food
Remark for Commission: 1,2-Benzisothiazolin-3-one is not stable in olive oil. Substitute test media, 95% ethanol or isoctane, should be used for testing compliance with SML. Only to be used in aqueous polymer dispersions and emulsions and at concentrations which do not result in an anti-microbial effect at the surface of the polymer or on the food itself

Needed data or information: None

References:
- EFSA (European Food safety Authority) 2006, opinion of the scientific Panel on food additives, flavourings, processing aids and materials in contact with food on the presence of 1,2-benzisothiazolin-3-one as an impurity in saccharin used as a food additive, EFSA Journal (2006) 416 http://www.efsa.europa.eu/en/science/afc/afc_opinions/ej416_bit_saccharin.html
- EC (European Commission) 1992, Scientific Committee on Food (SCF) Reports, 33rd Series, Opinions expressed until 3 May 1992, first report on certain additives used in the manufacture of plastic materials intended to come into contact with foodstuffs http://ec.europa.eu/food/fs/sc/scf/reports/scf_reports_33.pdf

Ref. No.: 39815
Name of the substance: 9,9-Bis(methoxymethyl)fluorene
CAS number: 182121-12-6
Ref. No.: 39815
Name of the substance: 9,9-Bis(methoxymethyl)fluorene

General information: According to the petitioner 9,9-bis(methoxymethyl)fluorene is intended to be used as an additive in the production of polypropylene homo/copolymers. Particular use is in thermoformed, blow molded objects and in films. It is used in combination with nucleating additives, in order to get a synergetic effect in nucleation and at a maximum concentration of 30 mg/kg. The substance is also used as a catalyst component (internal donor) in the same type of polymers at a formulation level of 5 mg/kg. Food contact applications include films and articles up to 1.5 mm thickness and for contact with all types of food under all time/temperature conditions including domestic use and for microwave re-heating; use in conventional ovens is excluded.

Previous evaluations (by SCF or AFC): The substance was first evaluated by the SCF (SCF, 1998) as a catalyst and was classified in SCF_List 3 with a restriction of 0.05 mg/kg food on the basis of the following data: Maximum worst case migration calculated to be 0.034 mg/kg; Ames assay (negative); in vitro chromosomal aberration assay (positive); in vitro mammalian cell gene mutation assay (negative); mouse bone marrow micronucleus assay (negative); rat bone marrow chromosome analysis (negative); in vivo UDS in rat liver (negative).

Available data used for this evaluation: The petitioner supplied additional data to support a new use of the substance which results in a higher migration than the current restriction.

Non-toxicity data: - Data on identity
- Data on physical and chemical properties
- Data on intended use and authorisation
- Data on migration

Toxicity data: - 90-day oral toxicity study
- Two studies on absorption, disposition, metabolism and elimination, one after single dose and one after repeated dosing for 7 days

Evaluation: Migration tests were carried out in contact with olive oil, 3 % acetic acid and 10% ethanol for 30 min at 121°C followed by 10 days at 40°C using polypropylene plates of 0.5 mm thickness and containing the substance at 22 mg/kg. The measured migration concentrations were 1.45 mg/kg for olive oil and 0.037 mg/kg and 0.063 mg/kg for 3 % acetic acid and 10 % ethanol, respectively. For the olive oil migration results, after conversion using the EU cube
Ref. No.: 39815
Name of the substance: 9,9-Bis(methoxymethyl)fluorene

ratio of 6 dm²/kg food this translates into a migration of 0.6 mg/kg olive oil which corresponds to total transfer of the additive into the simulant.

Analytical methods for the determination in food simulants and in polymer are available and well described.

9,9 Bis(methoxymethyl)fluorene was clastogenic in vitro only under metabolic activation conditions. It did not induce gene mutations in bacteria and in cultured mammalian cells. In vivo, oral administrations of the test article at the highest recommended dose to mice and rats produced mild clinical symptoms and signs of bone marrow toxicity, but no detectable clastogenic effect in bone marrow of a micronucleus assay in mice and a chromosome aberration test in rats nor DNA damage/repair in rat liver.

In conclusion, from the data available there is no indication of genotoxicity in vivo.

In an adequately performed 90-day repeated-dose toxicity study in rats, administration of 9,9 bis (methoxymethyl)-fluorene in doses up to approximately 750 mg/kg b.w./day did not induce histopathological changes even after the highest dose applied. Increases in relative liver weights were observed at this dose. In addition, changes in clinical chemistry (ketonuria) occurred in the 750 and 250 mg/kg b.w./day dose groups. The NOAEL from this study is derived as the lowest dose applied, 74 mg/kg b.w./day. Based on studies on the biotransformation and excretion of 9,9 bis (methoxymethyl)fluorene in rats (one single dose and one after repeated dosing of 100 mg/kg b.w./day daily for 7 days) showing a slow elimination of an unidentified lipophilic metabolite of 9,9 bis (methoxymethyl)fluorene from fat tissue with a half-life of 430 h accumulation in man is likely.

Conclusion: Based on the above-mentioned data the substance is classified:

SCF_List: 3
Restriction: 0.05 mg/kg food
Remark for Commission: Migration in fatty foods may exceed the proposed restriction.
FRF is applicable
Needed data or information None

References:
- Unpublished data from the petitioner submitted in March 1997,
Ref. No.: 39815
Name of the substance: 9,9-Bis(methoxymethyl)fluorene

- SCF, opinion on an additional list of monomers and additives for food contact materials (adopted the 18 September 1998)
  http://ec.europa.eu/food/fs/sc/scf/out16_en.html

Ref. No.: 45703
Name of the substance: cis-1,2-Cyclohexanedicarboxylic acid, calcium salt
CAS number: 491589-22-1

General information: According to the petitioner cis-1,2-cyclohexanedicarboxylic acid, calcium salt is intended to be used as a nucleating or clarifying agent in all kind of polyolefins. The maximum applied concentration is 0.25 % in polymer. The final product could come in contact with all types of foodstuffs and without restrictions concerning contact time and temperatures.

Previous evaluations (by SCF or AFC): None (new substance)

Available data used for this evaluation:
- Data on identity, physical and chemical properties
- Data on intended use and authorisation of the substance
- Data on purity and impurities
- Data on migration of the substance
- Gene mutation in bacteria
- In vitro chromosomal aberrations in cultured mammalian cells
- In vitro gene mutation in cultured mammalian cells
- 90-day oral toxicity study in rats

Evaluation: Specific migration tests on the substance were carried out using a low density polyethylene (LDPE) test sample containing 0.25% w/w additive. Migration tests were carried out using 3% acetic acid, 10% ethanol, 95% ethanol, and olive oil as food simulants. Test conditions included high temperature testing up to 100°C or reflux for 2 hours for aqueous simulants followed by 10 days at 40°C and 100°C for 4 hours in the case of olive oil. No migration to 10% ethanol, 95% ethanol, and olive oil was detected at a detection limit of 0.02 mg/kg. Migration to 3% acetic...
The test material was negative in three in vitro mutagenicity studies (reversion in bacteria, forward mutation and chromosomal aberrations in cultured mammalian cells). In a 90-day rat dietary toxicity study treatment-related histopathological changes of kidney and urinary bladder were observed at 20000 mg/kg feed (1340 mg/kg b.w./day, halved for males starting from day 22) in both sexes; treatment-related effects (increased trabecular bone formation and presence of haemoglobin and erythrocytes in the urine) were also observed in males treated with 5000 mg/kg feed. Some toxic effects observed in the 90-day rat study (viz. on kidney, bladder and bone) may be related to the high dose of calcium. The NOAEL from this study was 2500 mg/kg feed, equal to approximately 200 mg/kg b.w./day. Based on the octanol-water partition coefficient, accumulation in man is not expected.

Conclusion: Based on the above-mentioned data the substance is classified:

| SCF_List: | 3 |
| Restriction: | 5 mg/kg food |
| Remark for Commission: | None |
| Needed data or information | None |

References: Unpublished data provided by the petitioner in January 2007.
Ref. No.: 66775
Name of the substance: 2-Methyl-4-isothiazolin-3-one

Previous evaluations (by SCF or AFC):
The substance was first evaluated in 1984 by the SCF, opinion published in 1992 (SCF, 1992) and classified in SCF List 4A due to similarities with the substance 5-chloro-2-methyl-4-isothiazolin-3-one

Available data used for this evaluation:
Non-toxicity data:
- Data on identity
- Data on physical and chemical properties
- Data on intended use and authorisation
- Calculation of worst case migration from coated paper on the basis of the maximum use level
- Data on decomposition
- Data on actual content in dry coating and aqueous dispersion

Microbiological data:
- Lack of microbial inhibition in the food contact material

Toxicity data
- Gene mutation in bacteria
  - In vitro mammalian cell gene mutation test
  - In vitro mammalian chromosome aberration test
  - In vivo micronucleus test
  - In vivo/in vitro unscheduled DNA synthesis (UDS) assay
- 90-day oral toxicity study
- Teratogenicity study
- 28-day oral toxicity study
- Toxicokinetic study

Evaluation:
A validated analytical method for the determination of the specific migration of 2-methyl-4-isothiazolin-3-one (MIT) into food simulants has been provided. Olive oil was not a suitable test medium, due to a slow degradation of MIT over 10 days at 40°C attributed to reactions with peroxides. Substitute test media, 95% ethanol and isooctane, were used.

A worst case calculation of the migration of the substance from a coated paper sample resulted in a value of 0.25 mg/kg food.

Two tests have been performed to demonstrate that a combination of 1,2-benzisothiazolin-3-one (BIT) and MIT each used at a maximum concentration of 0.01% in polymer dispersions/aqueous emulsions does not exhibit any antimicrobial activity in a manufactured coated paper or board in contact with food. The concentration used corresponds to 0.02% BIT and 0.02% MIT in the dry coating for a
Ref. No.: 66775
Name of the substance: 2-Methyl-4-isothiazolin-3-one
solid content of 50% in the dispersions/emulsions.
The coated papers did not show antimicrobial activity against Staphylococcus aureus or Escherichia coli. using the film test.
The same coated papers tested for antimicrobial activity against Bacillus subtilis and Aspergillus niger spores using a second standard test also showed no antimicrobial activity.
The same coated papers tested for antimicrobial activity against Bacillus subtilis and Aspergillus niger spores using a second standard test also showed no antimicrobial activity.
Based on these results, the maximum concentration of the aqueous formulation that is intended for use, viz. 0.4% in aqueous emulsions will have no antimicrobial effect in the final article.

MIT did not show mutagenic potential in bacteria and mammalian cells in vitro. MIT did not induce chromosome aberrations in vitro; however the substance was not tested up to cytotoxic concentrations and therefore the test does not provide sufficient evidence to conclude that MIT has no clastogenic potential in mammalian cells in vitro. However, no clastogenic potential was observed in vivo in the micronucleus test in mice. In addition, a test formulation of a 13.9% aqueous solution of 5-chloro-2-methyl-4-isothiazolin-3-one (CIT) (2 parts) and MIT (1 part) was tested for its ability to induce DNA damage and repair in primary rat hepatocytes measured as unscheduled DNA synthesis (UDS). This mixture containing 4.6 % MIT and 9.3% of the structural similar compound CIT did not induce DNA repair in liver from in vivo exposed rats. It is concluded that MIT has no genotoxic potential in vivo.

MIT was tested in both a 90-day and a 28-day oral toxicity study. In a 90-day study the no observed adverse effect level (NOAEL) was 15 mg MIT/kg b.w./day. The NOAEL was based on increased relative and absolute spleen weights. Some results showing significant effects on sperm parameters in treated animals were not considered relevant, due to the large variability of baseline values among untreated groups. In any case, the Panel noted that a large margin of safety exists between the reported values for these effects and human exposure at the proposed restriction.
No teratogenic effects were observed following treatment with the test formulation. Effects in the foetuses (e.g. skeletal variations) were only observed at doses where also maternal toxicity (e.g. decreased food consumption, body weight) was observed. The NOAEL was 33 mg MIT/kg b.w./day based on maternal toxicity.
The Log Po/w is -0.32 (pH7, 20°C). Furthermore, in the metabolism
Ref. No.: 66775
Name of the substance: 2-Methyl-4-isothiazolin-3-one

study it was remaining that the absorption and excretion of MIT was rapid and only 1.3-2% of the administered radioactivity was found in the carcass and only 0.3% in the investigated tissue 168 hours following administration. Therefore MIT is not considered to have accumulative potential in man.

Although some other isothiazolines are known to be dermal sensitisers, MIT has rarely been reported to cause sensitisation. The Panel considers that low dose MIT exposure via the oral route is unlikely to result in sensitisation given the rarity of allergic reactions to MIT and the limited ability of the systemic route to elicit reactions. The Panel concludes dermal sensitisation is not relevant to the assessment of consumer exposure to MIT present in food contact articles.

Based on worst case migration potential and the NOAEL from the 90-day study the Panel considers a restriction of 0.5 mg/kg food would be appropriate. This would give a large margin of safety.

From the data available there is no indication for induction of gene mutations in bacteria. Additionally there is a lack of antimicrobial activity at the surface of the coated papers. This is considered to preclude the emergence of an antimicrobial-resistant population. Therefore, in the light of the current knowledge and considering the proposed use, there is no basis for concern for induction of antimicrobial resistance.

Conclusion: Based on the above-mentioned data the substance is classified:
SCF_List: 3
Restriction: 0.5 mg/kg food
Remark for Commission: 2-methyl-4-isothiazolin-3-one is not stable in olive oil. Substitute test media, 95% ethanol or iso-octane, should be used for testing compliance with SML.
Only to be used in aqueous polymer dispersions and emulsions and at concentrations which do not result in an anti-microbial effect at the surface of the polymer or on the food itself.

Needed data or information
None

References:
- Unpublished data submitted by petitioner on 20 December 2005 and 14 November 2006
Ref. No.: 66775  
Name of the substance: 2-Methyl-4-isothiazolin-3-one  
- EC (European Commission), 1992, Scientific Committee on Food (SCF) Reports, 33rd Series, Opinions expressed until 3 May 1992, first report on certain additives used in the manufacture of plastic materials intended to come into contact with foodstuffs  
http://ec.europa.eu/food/fs/sc/scf/reports/scf_reports_33.pdf

Ref. No.: 76463  
Name of the substance: Polyacrylic acid, sodium salt  
CAS number: 9003-04-7  

General information: According to the petitioner, polyacrylic acid, sodium salt is used as a dispersing agent for minerals and helps to grind mineral (e.g. CaCO3) fillers to be incorporated into plastics. Maximum percentage in the final article will be 0.25% w/w.

Previous evaluations (by SCF or AFC): None (new substance)

Available data used for this evaluation:  
Non-toxicity data:  
- Data on identity  
- Data on physical and chemical properties  
- Data on intended use and authorisation of the substance  
- Migration of a low average molecular weight substance  
- Data on recovery  

Toxicity data:  
- Gene mutation assay in bacteria,  
- Gene mutation assay in mammalian cells,  
- Chromosomal aberration assay (two studies),  
- In vivo micronucleus test,  
- In vitro unscheduled DNA synthesis (UDS)  
- 13-week oral toxicity study in rats

Evaluation: Solubility of the substance in water is >500 g/L and it is insoluble in olive oil. Log Po/w values have been calculated to be < -4 for the substance under ionised form and +4.5 for the acid form. Molecular weight range of the substance is 300 – 20000 Da. The weight average molecular weight (Mw) of the substance is 4500 Da, containing a fraction of 13% w/w with molecular weight <1000 Da. Migration was tested from low density polyethylene containing 0.25% w/w of the substance. In water after a contact period of 10
**Ref. No.:** 76463  
**Name of the substance:** Polyacrylic acid, sodium salt  

Days at 40°C no migration of the substance was detected, at a detection limit of 0.48 mg/kg. Specific migration in olive oil was not determined, considering the low solubility of the substance in olive oil, i.e. <0.5 mg/L.

Two samples of polyacrylic acid with Mw of 2000 (fraction below 1000 Da not specified) and Mw 4500 Da (13% below 1000 Da) were tested. The sample with Mw of 2000 was considered to be representative of lower molecular weight components. Both were negative in the following in vitro mutagenicity assays: reversion in bacteria, gene mutation and chromosomal aberrations in cultured mammalian cells, unscheduled DNA synthesis in rat primary hepatocytes. The polymer with a Mw of 2000 Da was also tested with negative results in the mouse bone marrow micronucleus test. Even though some of the studies were carried out using a limited protocol, the overall evidence provided indicates that polyacrylic acids with weight average molecular weight 2000-4500 Da are not genotoxic.

A 13-week oral toxicity study in rats was carried out with the polymer with a Mw of 4500 Da. The results obtained show a NOAEL of 500 mg/kg bw/day. The substance does not raise concern for potential for accumulation in man.

Based on the information available on the toxicological properties of low Mw polymers of acrylic acid and given the fact that acrylic acid is listed with a restriction of 6 mg/kg food in Commission Directive 2002/72/EC (Commission, 2002), the use of polyacrylic acid, sodium salt does not raise a toxicological concern.

**Conclusion:** Based on the above-mentioned data the substance is classified:

<table>
<thead>
<tr>
<th>SCF_List:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restriction:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Remark for Commission:** This evaluation covers also the relevant salts.

**Needed data or information:** None

**References:**

- Unpublished data provided by the petitioner in July 2004, July 2006 and December 2006.
Ref. No.: 76723
Name of the substance: Polydimethylsiloxane, 3-aminopropyl terminated, polymer with dicyclohexylmethane-4,4’-diisocyanate

CAS number: 167883-16-1

General information: According to the petitioner, polydimethylsiloxane, 3-aminopropyl terminated, polymer with dicyclohexylmethane-4,4’-diisocyanate, is a polymeric additive intended to be used as an extrusion processing aid and as an additive in polyolefins in concentrations up to 3% w/w.

Previous evaluations (by SCF or AFC): None (new substance)

Available data used for this evaluation:

Non-toxicity data:
- Data on identity
- Data on physical and chemical properties
- Data on use and authorisation
- Data on specific migration of the low molecular weight fraction of 1,3-bis-(3-aminopropyl)-1,1,3,3-tetramethyldisiloxane
- Data on possible migration of bis(4-aminocyclohexyl)methane (Ref No. 13210, SML= 0.05 mg/kg) as hydrolysis product of the isocyanate
- Data on residual content of starting substances in the additive

Toxicity data:
- Three in vitro mutagenicity tests on 1,3-bis(3-aminopropyl)-1,1,3,3-tetramethyldisiloxane
- A bacterial mutation assay with extracts of a similar polymeric additive, polydimethylsiloxane, 3-aminopropylgroup terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane (REF. No. 76725)

Evaluation: The weight average molecular weight of the polymeric additive is 91000 Da and the fraction <1000 Da is 1.2 % w/w. The two starting substances for the manufacture of this polymeric additive are α,ω-bis(3-aminopropyl)polydimethylene-siloxane (APPMS) and dicyclohexylmethane 4,4’-diisocyanate (DCHI).
APPMS is itself a polymer, with a weight average molecular weight of 2500 Da. DCHI is an authorised isocyanate (REF No. 15700, Commission 2002). It may hydrolyse into the corresponding bis(4-aminocyclohexyl)methane (DCHA), which is also an authorised substance (REF No. 13210, Commission 2002).

Migration tests were performed with a sample consisting entirely of the polymeric additive, which is considered to be a worst case, since the actual material to be used will contain only 3% of the substance. The content of residual starting APPMS was less than 2.4 mg/kg polymeric additive. The migration of the low molecular weight fraction of APPMS into 3% acetic acid, 10% ethanol and isooctane after 10d at 40°C was not detectable (detection limit in aqueous simulants: 0.016 mg/kg, in isooctane: 0.050 mg/kg).

The content of residual starting isocyanate DCHI was less than 0.0009 mg/kg polymeric additive. Assuming that all the isocyanate would be hydrolysed, the maximum possible migration of the hydrolysis product DCHA from a polyethylene sample containing 3% polymeric additive was calculated to be 0.0008 mg/kg food, while its restriction is 0.05 mg/kg food.

1,3-Bis(3-aminopropyl)-1,1,3,3-tetramethyldisiloxane (APMS, MW= 244 g/mole, the smallest possible oligomer present at 1% in APPMS), was used as a worst case representative of aminopropyl groups with respect to the APPMS starting substance. APMS had negative results in mutation tests with bacteria and mammalian cells and was not clastogenic in mammalian cells. Based on these in vitro data it is concluded that APPMS has no genotoxic potential.

Extracts of a similar polymeric additive, polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane, (in 0.9% NaCl and in DMSO) showed no mutagenic effects in bacteria.

Based on:
- migration of the low molecular weight fraction of the polymeric additive was not detected,
- DCHI, one of the starting substances, as well as its hydrolysis product DCHA, are included in the positive list
Ref. No.: 76723
Name of the substance: Polydimethylsiloxane, 3-aminopropyl terminated, polymer with dicyclohexylmethane-4,4′-diisocyanate of the Directive 2002/72/EC with restrictions of 1 mg/kg plastic (QM) expressed as isocyanate group (NCO) and 0.05 mg/kg food (SML), respectively,
- APPMS, the other starting substance, is considered non-genotoxic,
- a bacterial mutagenicity test for a similar polymeric substance (polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane, REF. No. 76725) was negative,
the intended use of the substance without specific restriction can be regarded of no toxicological concern.

Conclusion: Based on the above-mentioned data the substance is classified:

| SCF List: | 3 |
| Restriction: | None |
| Remark for Commission: Specifications: | The fraction with molecular weight below 1000 Da should not exceed 1.5% w/w |
| Needed data or information | None |

References: - Unpublished data submitted by petitioner in December 2006
- Commission Directive 2002/72/EC, relating to plastic materials and articles intended to come into contact with foodstuffs

Ref. No.: 76725
Name of the substance: Polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane

CAS number: 661476-41-1

General information: According to the petitioner, polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane, is a polymeric additive intended to be used as an extrusion processing aid and as an additive in polyolefins, in
Ref. No.: 76725

Name of the substance: Polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane concentrations up to 3% w/w.

Previous evaluations (by SCF or AFC):
None (new substance)

Available data used for this evaluation:

Non-toxicity data: - Data on identity  
- Data on physical and chemical properties  
- Data on use and authorisation  
- Data on specific migration of the low molecular weight fraction of the starting substance α,ω-bis(3-aminopropyl)polydimethylsiloxane  
- Data on possible migration of 1-amino-3-aminomethyl-3,5,5-trimethylcyclohexane as hydrolysis product of the starting isocyanate  
- Data on residual content of starting substances in the additive

Toxicity data: - Three in vitro mutagenicity tests on α,ω-bis(3-aminopropyl)tetramethyldisiloxane  
- A bacterial mutation assay with extracts of polydimethylsiloxanes, 3-aminopropyl group terminated, polymers with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane

Evaluation:
The weight average molecular weight of the polymeric additive is 521400 Da and the fraction below 1000 Da is 0.73 % w/w.
The starting substances for the polymeric additive are α,ω-bis(3-aminopropyl)polydimethylsiloxane (APPMS) and 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane (IITMC).
APPMS is itself a polymer, with a weight averaged molecular weight of 2500 Da.
IITMC is an authorised isocyanate (REF. No. 19110, Commission 2002). It may hydrolyse into the corresponding 1-amino-3-aminomethyl-3,5,5-trimethylcyclohexane (AATMC), which is also an authorised substance (REF. No. 12670).
Migration tests were performed with a sample consisting entirely of the polymeric additive, which is considered to be a worst case, since the actual material to be used will contain only 3% of the substance. The content of residual starting APPMS was less than 2.4 mg/kg polymeric additive. The migration of the low molecular...
The content of residual starting isocyanate IITMC was less than 0.24 mg IITMC/kg polymeric additive. Assuming that all the isocyanate would be hydrolysed, the maximum possible migration of the hydrolysis product AATMC from a polyethylene sample containing 3% polymeric additive was calculated to be 0.001 mg/kg food.

1,3-Bis(3-aminopropyl)-1,1,3,3-tetramethyldisiloxane (APMS, MW= 244 g/mole, the smallest possible oligomer present at 1% in APPMS), was used as a worst case representative of aminopropyl groups with respect to the APPMS starting substance. APMS had negative results in mutation tests with bacteria and mammalian cells and was not clastogenic in mammalian cells. Based on these in vitro-data it is concluded that APPMS has no genotoxic potential. Extracts of the polymeric additive (in 0.9% NaCl and in DMSO) showed no mutagenic effects in bacteria.

Based on:
- migration of the low molecular weight fraction of the polymeric additive was not detected,
- IITMC, one of the starting substances, as well as its hydrolysis product AATMC, are included in the positive list of the Directive 2002/72/EC with restrictions of 1 mg/kg plastic (QM) expressed as isocyanate group (NCO) and 6 mg/kg food (SML), respectively,
- APPMS, the other starting substance, is considered as non-genotoxic,
- a bacterial mutagenicity test with extracts of the polymeric additive itself was negative,
the intended use of the substance without specific restriction can be regarded of no toxicological concern.

Conclusion: Based on the above-mentioned data the substance is classified:

<p>| SCF List: | 3 |
| Restriction: | None |
| Remark for Commission: | Specifications: The fraction with molecular weight below 1000 Da should not exceed 1 % w/w. |</p>
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<tr>
<th>Ref. No.:</th>
<th>76725</th>
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<tr>
<td>Name of the substance:</td>
<td>Polydimethylsiloxane, 3-aminopropyl terminated, polymer with 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane</td>
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<tr>
<td>Needed data or information</td>
<td>None</td>
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</tbody>
</table>

**References:**
- Unpublished data submitted by petitioner in December 2006
- Commission Directive 2002/72/EC, relating to plastic materials and articles intended to come into contact with foodstuffs

<table>
<thead>
<tr>
<th>Ref. No.:</th>
<th>86430</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the substance:</td>
<td>Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)</td>
</tr>
</tbody>
</table>
| CAS number: | TiO₂: 013463-67-7  
AgCl: 007783-90-6 |

**General information:** According to the petitioner 20% (w/w) silver chloride coated onto 80% (w/w) titanium dioxide is intended to be used as a preservative in water-based polymer emulsions and as a surface biocide in polymeric food contact materials to protect the surface of finished articles from microbial contamination during storage and subsequent use. Application is in a wide range of food contact materials intended for single or repeated use in contact with all types of food. When used as a preservative in water based polymer emulsions, maximum use level is 150 mg/l emulsion; as a surface biocide maximum amount in formulation is 3000 mg/kg polymer (typical values are 1000 mg/kg).

**Previous evaluations (by SCF or AFC):** The substance was first evaluated in 1998 (SCF, 1998) and classified in SCF_List 7 based on inadequate migration data, worst case calculation of migration of 2.45 μg silver per dm² of coated paper; four (negative) in vitro mutagenicity studies; acute toxicity data; 28-day oral rat study.
Needed: Confirmation of the figure of 27.2 mg/m² paper (paragraph 5.1.2 of the SDS); properly described analytical method with sufficient data on calibration and detection limit.

**Available data**
Ref. No.: 86430  
Name of the substance: Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)

**used for this evaluation:**
- Non-toxicity data:
  - Data on identity
  - Data on physical and chemical properties
  - Data on use and authorisation
  - Data on migration
  - Data on residual content

- Microbiological data:
  - Spectrum of antimicrobial activity
  - Minimum inhibitory concentrations
  - Efficacy when incorporated into FCMs
  - Efficacy after repeated use
  - Lack of activity against microbes in food

- Toxicity data:
  - 2 gene mutation assays in bacteria
  - Chromosomal aberration assay in cultured mammalian cells
  - Gene mutation assay in cultured mammalian cells
  - 28-day oral rat study

**Evaluation:**
Specific migration into water, 3% acetic acid, 15% ethanol and olive oil was determined from a latex coated paper after a contact period of 10 days at 40°C. Migration of silver into any of the simulants was not detected at a detection level of 0.003 and 0.015 mg/kg in aqueous food simulants and olive oil, respectively. Worst case migration of silver from polyvinylchloride (PVC) film (thickness 8 µm) was calculated to be 2.29 µg/kg assuming 100% migration of subject substance from PVC film containing 25 mg/kg of subject substance.

Migration experiments with polypropylene (PP) crates containing 0.15% of the additive were performed in 3% acetic acid by total immersion. Silver migration was found to be not-detectable; the detection limit corresponding to < 0.016 mg silver/6 dm².

Silver migration from High Impact Polystyrene (HIPS) and PP containing 3000 mg/kg of the additive was determined in 3% acetic acid after 10 days at 40°C. From PP the migration was found to be non-detectable or <0.006 mg/kg, while silver migration from HIPS was found to be 0.012 mg/kg.

The applicant has demonstrated that the substance in a number of polymers (PVC, PU and HIPS) is effective as a biocide at levels from 0.1 – 0.3% and can reduce the viability of a culture of...
Ref. No.: 86430

Name of the substance: Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)

*Staphylococcus aureus* by more than 2 logs in the film test. The measurement of minimum inhibitory concentrations (MICs) for the substance against *Escherichia coli, Pseudomonas aeruginosa, Salmonella enterica* var *typhimurium* and *Staphylococcus aureus* had values within the range 0.0008 and 0.002% (w/v of a 10% suspension).

Virtually all microorganisms that might be expected to be present in a food environment will be sensitive to silver ions so that the problem of silver-resistant species overgrowing the biocidal surfaces appears unlikely. Additionally the use of silver compounds in water treatment and medical environments has not so far encouraged the selection of silver-resistant mutants in the sensitive population of microbes.

Lack of antimicrobial activity against food in contact with the FCM has not been demonstrated by the applicant satisfactorily since the contact period was only 10 minutes whereas efficacy was measured after 22 hours. Based on previously evaluated silver biocides (EFSA, 2004 and 2005) it can be expected that the substance will not demonstrate antimicrobial activity on the food.

No evidence is provided of efficacy under ‘in use’ conditions i.e. to demonstrate that the use of biocides in FCMs improves the hygienic state of manufacturing plant and food preparation areas over and above that of general cleaning procedures although the laboratory experiments reported suggest that might be the case.

Silver chloride coated onto titanium dioxide is a poorly soluble inorganic material releasing only minute quantities of silver ions as the active constituent and could only be tested as a suspension. Therefore, genotoxicity tests of such insoluble materials are of limited value to characterise the potential genotoxic properties of silver.

The AFC Panel also took note of the WHO "Guidelines for drinking-water quality". According to these Guidelines a total lifetime oral intake of about 10 g of silver (equal to 0.39 mg/day/person) can be considered on the basis of epidemiological and pharmacokinetic knowledge as the human NOAEL. To maintain the bacteriological quality of drinking water, levels of silver up to 0.1 mg/l, could be tolerated without risk to health. On the basis of a daily intake of 2 l of drinking water this concentration is equal to a daily silver intake of 0.2 mg/person and gives a total dose over 70 years of half the human NOAEL (WHO 1996).
Name of the substance: Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)

Based on the data above, an allocation of the substance to a group restriction of 0.05 mg/kg food (as silver) would limit oral intake of silver from food contact materials uses to less than 12.5 % of the human NOAEL

Conclusion:

Based on the above-mentioned data the substance is classified:

SCF_List: 3
Restriction: Group restriction of 0.05 mg Ag/kg food
Remark for Commission: It is used as a preservative in water based polymer emulsions or a surface biocide.
Needed data or information: None

References:

- EFSA (European Food safety Authority), 2004, opinion of the Scientific Panel on food additives, flavourings, processing aids and materials in contact with food (AFC) on a request from the Commission related to a 4th list of substances for food contact materials, adopted in May 2004 http://www.efsa.europa.eu/en/science/afc/afc_opinions/468.html
- EFSA, (European Food safety Authority), 2005, opinion of the Scientific Panel on food additives, flavourings, processing aids and materials in contact with food (AFC) on a request from the Commission related to a 7th list of substances for food contact materials, adopted in March 2005 http://www.efsa.europa.eu/en/science/afc/afc_opinions/890.html
<table>
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<tr>
<td>Name of the substance:</td>
<td>Silver chloride (20% w/w) coated onto titanium dioxide (80% w/w)</td>
</tr>
</tbody>
</table>

2006.
APPENDIX

DEFINITION OF THE SCF LISTS

The classification into a SCF List is a tool used for tackling authorisation dossiers and do not prejudice the management decisions that will be taken on the basis of the scientific opinions of the AFC Panel and in the framework of the applicable legislation.

List 0
Substances, e.g. foods, which may be used in the production of plastic materials and articles, e.g. food ingredients and certain substances known from the intermediate metabolism in man and for which an ADI need not be established for this purpose.

List 1
Substances, e.g. food additives, for which an ADI (=Acceptable Daily Intake), a t-ADI (=temporary ADI), a MTDI (=Maximum Tolerable Daily Intake), a PMTDI (=Provisional Maximum Tolerable Daily Intake), a PTWI (=Provisional Tolerable Weekly Intake) or the classification "acceptable" has been established by this Committee or by JECFA.

List 2
Substances for which this Committee has established a TDI or a t-TDI.

List 3
Substances for which an ADI or a TDI could not be established, but where the present use could be accepted. Some of these substances are self-limiting because of their organoleptic properties or are volatile and therefore unlikely to be present in the finished product. For other substances with very low migration, a TDI has not been set but the maximum level to be used in any packaging material or a specific limit of migration is stated. This is because the available toxicological data would give a TDI, which allows that a specific limit of migration or a composition limit could be fixed at levels very much higher than the maximum likely intakes arising from present uses of the additive. Depending on the available toxicological studies a restriction of migration into food of 0.05 mg/kg of food (3 mutagenicity studies only) or 5 mg/kg of food (3 mutagenicity studies plus 90-day oral toxicity study and data to demonstrate the absence of potential for bio-accumulation in man) may be allocated.

List 4 (for monomers)

4A Substances for which an ADI or TDI could not be established, but which could be used if the substance migrating into foods or in food simulants is not detectable by an agreed sensitive method.

4B Substances for which an ADI or TDI could not be established, but which could be used if the levels of monomer residues in materials and articles intended to come into contact with foodstuffs are reduced as much as possible.

List 4 (for additives)
Substances for which an ADI or TDI could not be established, but which could be used if the substance migrating into foods or in food simulants is not detectable by an agreed sensitive method.

**List 5**

Substances that should not be used.

**List 6**

Substances for which there exist suspicions about their toxicity and for which data are lacking or are insufficient.

The allocation of substances to this list is mainly based upon similarity of structure with that of chemical substances already evaluated or known to have functional groups that indicate carcinogenic or other severe toxic properties.

- **6A** Substances suspected to have carcinogenic properties. These substances should not be detectable in foods or in food simulants by an appropriate sensitive method for each substance.
- **6B** Substances suspected to have toxic properties (other than carcinogenic). Restrictions may be indicated.

**List 7**

Substances for which some toxicological data exist, but for which an ADI or a TDI could not be established. The required additional information should be furnished.

**List 8**

Substances for which no or only scanty and inadequate data were available.

**List 9**

Substances and groups of substances which could not be evaluated due to lack of specifications (substances) or to lack of adequate description (groups of substances).

Groups of substances should be replaced, where possible, by individual substances actually in use. Polymers for which the data on identity specified in "SCF Guidelines" are not available.

**List W**

"Waiting list". Substances not yet included in the Community lists, as they should be considered "new" substances, i.e. substances never approved at national level. These substances cannot be included in the Community lists, lacking the data requested by the Committee.

**Term used relevant to migration:**

**Overall migration (OM):** The sum of the amounts of volatile and non volatile substances, except water, released from a food contact material or article into food or food stimulant.

**Specific migration:** The amount of a specific substance released from a food contact material or article into food or food stimulant.
### LIST OF ABBREVIATIONS:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AATMC</td>
<td>1-amino-3-aminomethyl-3,5,5-trimethylcyclohexane</td>
</tr>
<tr>
<td>APMS</td>
<td>1,3-Bis(3-aminopropyl)-1,1,3,3-tetramethyldisiloxane</td>
</tr>
<tr>
<td>APPMS</td>
<td>α,ω-Bis(3-aminopropyl)-polydimethylsiloxane</td>
</tr>
<tr>
<td>BIT</td>
<td>1,2-Benzisothiazolin-3-one</td>
</tr>
<tr>
<td>CDI</td>
<td>Bis(2,6-diisopropylphenyl)carbodiimide</td>
</tr>
<tr>
<td>CIT</td>
<td>5-chloro-2-Methyl-4-isothiazolin-3-one</td>
</tr>
<tr>
<td>DDAO</td>
<td>Dodecyldimethylamine oxide</td>
</tr>
<tr>
<td>DMSO</td>
<td>Dimethyl sulphoxide</td>
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<tr>
<td>DCHA</td>
<td>Bis(4-aminocyclohexyl)methane</td>
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<tr>
<td>DCHI</td>
<td>Dicyclohexylmethane 4,4'-diisocyanate</td>
</tr>
<tr>
<td>DL</td>
<td>Detection limit</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>GLP</td>
<td>Good Laboratory Practice</td>
</tr>
<tr>
<td>HIPS</td>
<td>High Impact Polystyrene</td>
</tr>
<tr>
<td>IITMC</td>
<td>1-isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane</td>
</tr>
<tr>
<td>JECFA</td>
<td>Joint expert Committee on food additives</td>
</tr>
<tr>
<td>LDPE</td>
<td>Low Density Polyethylene</td>
</tr>
<tr>
<td>MIC</td>
<td>Minimum inhibitory concentration</td>
</tr>
<tr>
<td>MIT</td>
<td>2-Methyl-4-isothiazolin-3-one</td>
</tr>
<tr>
<td>NCO</td>
<td>Isocyanate moiety</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No observed adverse effect level</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for economic co-operation and development</td>
</tr>
<tr>
<td>PP</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>PVC</td>
<td>Polyvinyl chloride</td>
</tr>
<tr>
<td>QM</td>
<td>Maximum permitted quantity in the finished material or article</td>
</tr>
<tr>
<td>SCF</td>
<td>Scientific Committee on food</td>
</tr>
<tr>
<td>SML</td>
<td>Specific migration limit</td>
</tr>
<tr>
<td>TDI</td>
<td>Tolerable daily intake</td>
</tr>
<tr>
<td>UDS</td>
<td>Unscheduled DNA synthesis</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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</tbody>
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