SAFETY DATA SHEET
North American Version

HYDROGEN PEROXIDE (35% <= Conc. < 50%)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name: HYDROGEN PEROXIDE (35% <= Conc. < 50%)
Product grade(s): Interox® PH-35/3 Hydrogen Peroxide
Chemical Name: Hydrogen peroxide
Synonyms: Hydroperoxide, Hydrogen dioxide, Hydrogen peroxide, aqueous solution
Molecular formula: H₂O₂
Molecular Weight: 34 g/mol

1.2. Use of the Substance/Mixture

Recommended use:
- Bleaching agent
- Chemical industry
- Electronic industry
- Metal treatment
- Odour agents
- Oxidising Agents
- Textile industry
- Water treatment
- Pulp and paper
- Food additive

1.3. Company/Undertaking Identification

Address: SOLVAY CHEMICALS, INC.
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone number: 1 (800) 424-9300 CHEMTREC® (USA & Canada)
01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number (product information):
US: +1-800-765-8292 (Product information)
US: +1-713-525-6500 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA: H= 3  F= 0  I= 1  S= OX
HMIS: H= 3  F= 0  R= 1  PPE = Supplied by User; dependent on local conditions

General Information
Appearance: liquid
Colour: colourless
Odour: pungent

Main effects
- none

2.2. Potential Health Effects:

Inhalation
- Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough.
- Risk of: Nose bleeding, chronic bronchitis.

Eye contact
- Corrosive
- May cause irreversible eye damage.
- Symptoms: Redness, Lachrymation, Swelling of tissue.

Skin contact
- Irritation
- Risk of: Burn.

Ingestion
- Severe irritation
- Symptoms: Nausea, Abdominal pain, Vomiting, Diarrhoea, Risk of chemical pneumonitis from product inhalation.

Other toxicity effects
- See section 11: Toxicological Information

2.3. Environmental Effects:
- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen peroxide
CAS-No.: 7722-84-1
Concentration: >= 35,0 - < 50,0 %

4. FIRST AID MEASURES

4.1. Inhalation
- Move to fresh air.
- If symptoms persist, call a physician.

4.2. Eye contact
- Call a physician or poison control centre immediately.
- In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).

4.3. Skin contact
- Remove and wash contaminated clothing before re-use.
- Wash off with soap and water.
- If symptoms persist, call a physician.

4.4. Ingestion
- Rinse mouth with water.
- Do NOT induce vomiting.
- If accidentally swallowed obtain immediate medical attention.
- Oxygen or artificial respiration if needed.

4.5. Notes to physician

*Exposure to decomposition products:*
- Consult with an ophthalmologist immediately in all cases.
- If accidentally swallowed obtain immediate medical attention.
- When symptoms persist or in all cases of doubt seek medical advice.

5. FIREFIGHTING MEASURES

5.1. Suitable extinguishing media
- Water
- Water spray

5.2. Extinguishing media which shall not be used for safety reasons
- None.

5.3. Special exposure hazards in a fire
- Oxygen released in thermal decomposition may support combustion
- Contact with combustible material may cause fire.
- Contact with flammables may cause fire or explosions.
- Risk of explosion if heated under confinement.

5.4. Hazardous decomposition products
- Oxygen

5.5. Special protective equipment for firefighters
- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.
- Wear chemical resistant oversuit
- Cool containers / tanks with water spray.
- Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel
- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.

6.1.2. Advice for emergency responders
- Evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.
- Use personal protective equipment.

6.2. Environmental precautions
- In case of accidental release or spill, immediately notify the appropriate authorities if required by Federal, State/Provincial and local laws and regulations.
- Do not dump into any sewers, on the ground, or into any body of water. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations.
6.3. Methods and materials for containment and cleaning up
- Dam up.
- Do not mix waste streams during collection.
- Soak up with inert absorbent material.
- Keep in suitable, closed containers for disposal.
- Never return spills in original containers for re-use.

6.4. Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE

7.1. Handling
- Use only in well-ventilated areas.
- Use only clean and dry utensils.
- Never return unused material to storage receptacle.
- Keep away from heat.
- Avoid inhalation, ingestion and contact with skin and eyes.
- Keep away from Incompatible products.

7.2. Storage
- Keep only in the original container.
- Store in a receptacle equipped with a vent.
- Store in a well-ventilated place. Keep cool.
- Keep container closed.
- Keep in a bunded area.
- Keep away from Incompatible products.
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Regularly check the condition and temperature of the containers.
- Electrical equipment should be protected to the appropriate standard.

7.3. Packaging material
- aluminium 99.5 %
- stainless steel 304L / 316L
- Approved grades of HDPE.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Hydrogen peroxide
- Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) 07 2009
  time weighted average = 1 ppm
  time weighted average = 1.4 mg/m³
- Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) 09 2011
  time weighted average = 1 ppm
- Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) 11 2010
  time weighted average = 1 ppm
- US. ACGIH Threshold Limit Values 02 2012
  time weighted average = 1 ppm
- Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) 11 2011
  time weighted average = 1 ppm
  time weighted average = 1.4 mg/m³
8.2. Engineering controls
- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

8.3. Personal protective equipment

8.3.1. Respiratory protection
- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/national standards.
- Use NIOSH approved respiratory protection.
- Wear an approved full-face air supplied respirator for excessive or unknown concentrations. Selected chemical cartridges for respirators, i.e. OV, OV/AG, GME have been tested successfully under lab conditions to remove hydrogen peroxide and peracetic acid vapors in concentrations exceeding the applicable exposure limits. Further information is available in a Solvay Chemicals, Inc. Technical Communication, located at http://www.solvaychemicals.us/resource.htm in the Peractic Acid section.

8.3.2. Hand protection
- Impervious gloves
- Suitable material: PVC, Natural Rubber, butyl-rubber, Nitrile rubber
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

8.3.3. Eye protection
- Chemical resistant goggles must be worn.
- If splashes are likely to occur, wear: Tightly fitting safety goggles, Face-shield

8.3.4. Skin and body protection
- Chemical resistant apron
- Suitable material
- PVC
- Natural Rubber
- If splashes are likely to occur, wear: Apron, Boots

8.3.5. Hygiene measures
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
</tbody>
</table>
Odour : pungent

9.2. Important health safety and environmental information

pH : 2,02 (H₂O₂ 50 %)
pKa
  : pKa1= 11,62
     Temperature: 25 °C ( 77 °F )

Boiling point/boiling range : 108 °C ( 226 °F ) (H₂O₂ 35 %)
Flash point : Remarks: not applicable
Flammability : Remarks: The product is not flammable.
Explosive properties : Explosion danger:
  Remarks: Not explosive
Oxidizing properties : Remarks: Non oxidizer
Vapour pressure : 1 mbar (H₂O₂ 50 %)
  Temperature: 30 °C ( 86 °F )
Relative density / Density : 1,1 - 1,2
Bulk density : Remarks: not applicable
Solubility(ies) : Remarks: no data available
Partition coefficient: n-octanol/water
  : log Pow:
     -1,57
     Method: calculated value
Viscosity : 1,17 mPa.s (H₂O₂ 50 %)
  Temperature: 20 °C ( 68 °F )
Vapour density : 1

9.3. Other data
Freezing point: : -33 °C ( -27 °F ) (H₂O₂ 35 % )

Auto-flammability : Remarks: The product is not flammable.
Surface tension : 75,6 mN/m (H₂O₂ 50 %)
  Temperature: 20 °C ( 68 °F )
Decomposition temperature : >= 60 °C ( 140 °F )
  Remarks: Self-Accelerating decomposition temperature (SADT)
  : < 60 °C ( 140 °F )
     Remarks: Slow decomposition

10. STABILITY AND REACTIVITY

10.1. Stability
  - Stable under recommended storage conditions.

10.2. Conditions to avoid
  - Contamination
- To avoid thermal decomposition, do not overheat.
- Keep at temperature not exceeding: 60 °C (140 °F)
- Keep at temperature not exceeding: 60 °C (140 °F)

10.3. Materials to avoid
- Acids, Bases, Metals, Heavy metal salts, Powdered metal salts, Reducing agents, Organic materials, Flammable materials

10.4. Hazardous decomposition products
- Oxygen

11. TOXICOLOGICAL INFORMATION

Toxicological data

**Acute oral toxicity**
- LD50, rat, 1.193 - 1.270 mg/kg (H2O2 35 %)

**Acute inhalation toxicity**
- LC50, 4 h, rat, > 0.17 mg/l, Remarks: vapour (H2O2 50 %)

**Acute dermal irritation/corrosion**
- LD50, rabbit, > 2.000 mg/kg (H2O2 35 %)

**Skin irritation**
- rabbit, Skin irritation (H2O2 35 %)

**Eye irritation**
- rabbit, Severe eye irritation (H2O2 10 %)

**Sensitisation**
- guinea pig, Did not cause sensitization on laboratory animals.

**Chronic toxicity**
- Oral, 90-day, mouse, Target Organs: Gastrointestinal tract, Lowest observable effect level: 300 ppm, LOAEL
- Oral, 90-day, mouse, NOEL: 100 ppm, NOAEL
- Inhalation, 28-day, rat, Target Organs: Respiratory system, Lowest observable effect level: 10 ppm, LOAEL, vapour
- Inhalation, 28-day, rat, NOEL: 2 ppm, NOAEL, vapour

**Carcinogenicity**
- Oral, Prolonged exposure, mouse, Target Organs: duodenum, carcinogenic effects
- Dermal, Prolonged exposure, mouse, Animal testing did not show any carcinogenic effects.

**Genetic toxicity in vitro**
- In vitro tests have shown mutagenic effects.

**Genetic toxicity in vivo**
- In vivo tests did not show mutagenic effects

**Reproductive toxicity**
- Substance is totally biotransformed (metabolised).
- study scientifically unjustified

**Remarks**
- no data available

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

**Acute toxicity**
- Fishes, Pimephales promelas, LC50, 96 h, 16.4 mg/l
- Fishes, Pimephales promelas, NOEC, 96 h, 4,3 mg/l
- Crustaceans, Daphnia pulex, EC50, 48 h, 2,4 mg/l
  Remarks: fresh water, semi-static test
- Crustaceans, Daphnia pulex, NOEC, 48 h, 1 mg/l
  Remarks: fresh water, semi-static test

**Chronic toxicity**
- Algae, Skeletonema costatum, EC50, growth rate, 72 h, 2,6 mg/l
- Algae, Skeletonema costatum, NOEC, 72 h, 0,63 mg/l
- Algae, Chlorella vulgaris, EC50, Growth rate, 72 h, 4,3 mg/l
- Algae, Chlorella vulgaris, NOEC, 72 h, 0,1 mg/l

**12.2. Mobility**
- Air, Volatility, Henry's law constant (H) = 0,75 kPa·m³/mol
  Conditions: 20 °C
  Remarks: not significant
- Water
  Remarks: considerable solubility and mobility
- Soil/sediments, log KOC: 0.2
  Remarks: non-significant evaporation and adsorption

**12.3. Persistence and degradability**

**Abiotic degradation**
- Air, indirect photo-oxidation, t 1/2 24 h
  Conditions: sensitizer: OH radicals
- Water, redox reaction, t 1/2 120 h
  Conditions: mineral and enzymatic catalysis, fresh water, salt water
- Soil, redox reaction, t 1/2 12 h
  Conditions: mineral and enzymatic catalysis

**Biodegradation**
- aerobic, t 1/2 < 2 min
  Conditions: biological treatment sludge
  Remarks: Readily biodegradable.
- aerobic, t 1/2 from 0,3 - 5 d
  Conditions: fresh water
  Remarks: Readily biodegradable.
- anaerobic
  Conditions: Soil/sediments
  Remarks: not applicable

**12.4. Bioaccumulative potential**
- Bioaccumulative potential: -1,57
  Result: Does not bioaccumulate.

**12.5. Other adverse effects**
- no data available

**12.6. Remarks**

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**13. DISPOSAL CONSIDERATIONS**

**13.1. Waste from residues / unused products**
- Limited quantity
- Dilute with plenty of water.
- Flush into sewer with plenty of water.
13.2. Packaging treatment
- Empty containers.
- Clean container with water.
- Dispose of rinse water in accordance with local and national regulations.
- Where possible recycling is preferred to disposal or incineration.
- In accordance with local and national regulations.

14. TRANSPORT INFORMATION

IATA-DGR
- UN number: UN 2014
- Class: 5.1
- Packing group: II
- ICAO-Labels: 5.1 - Oxidizing substances
- Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

IMDG
- UN number: UN 2014
- Class: 5.1
- Packing group: II
- IMDG-Labels: 5.1 - Oxidizing substances
- EmS: F-H
- S-Q
- Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

U.S. Dept of Transportation
- UN number: UN 2014
- Class: 5.1
- Packing group: II
- Label: 5.1 - Oxidizing substances
- EmS: 140
- Remarks: UN 1066, NITROGEN COMPRESSED, 2.2
- Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

Canada (TDG)
- UN number: UN 2014
- Class: 5.1
- Packing group: II
- Label: 5.1 - Oxidizing substances
EmS 140
Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

Mexico (NOM-002-SCT)
- UN number: UN 2014
- Class: 5.1
- Packing group: II
- Label: 5.1 - Oxidizing substances
  8 - Corrosive
  - IATA: forbidden over 40 %

15. REGULATORY INFORMATION

15.1. Inventory Information

<table>
<thead>
<tr>
<th></th>
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<th>In compliance with inventory.</th>
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<tbody>
<tr>
<td>Toxic Substance Control Act list (TSCA)</td>
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<tr>
<td>Australian Inventory of Chemical Substances (AICS)</td>
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<tr>
<td>Canadian Domestic Substances List (DSL)</td>
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<tr>
<td>Korean Existing Chemicals Inventory (KECI (KR))</td>
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<tr>
<td>EU list of existing chemical substances (EINECS)</td>
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<tr>
<td>Japanese Existing and New Chemical Substances (MITI List) (ENCS)</td>
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<tr>
<td>Inventory of Existing Chemical Substances (China) (IECS)</td>
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<tr>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
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<tr>
<td>New Zealand Inventory of Chemicals (NZIOC)</td>
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</tbody>
</table>

15.2. Other regulations

15.3. Classification and labelling

- C - Oxidizing Material
- E - Corrosive Material
- F - Dangerously Reactive Material
- D1B - Toxic Material Causing Immediate and Serious Toxic Effects

Remarks: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

EC Label - According to Regulation (EC) 1272/2008, as amended
Name(s) on label

Hazardous components: Hydrogen peroxide (>= 35 - < 50 %)

Signal word

Danger

Hazard pictograms

Hazard statements
H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.

Precautionary statements

Prevention
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Response
P310 - Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.

16. OTHER INFORMATION

Ratings:

NFPA (National Fire Protection Association)
Health = 3  Flammability = 0  Instability = 1  Special =OX

HMIS (Hazardous Material Information System)
Health = 3  Fire = 0  Reactivity = 1  PPE : Supplied by User; dependent on local conditions

Further information
- New (SDS)
- Distribute new edition to clients
- The National Transportation Safety Board (NTSB) and Federal Aviation Administration (FAA) have requested the following information be provided:
- Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed.
Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

Wear an approved full-face air supplied respirator for excessive or unknown concentrations. Selected chemical cartridges for respirators, i.e. OV, OV/AG, GME have been tested successfully under lab conditions to remove hydrogen peroxide and peracetic acid vapors in concentrations exceeding the applicable exposure limits. Further information is available in a Solvay Chemicals, Inc. Technical Communication, located at http://www.solvaychemicals.us/resource.htm in the Peractic Acid section.

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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