1. Product and Company Identification

Product identifier: AGROTAIN® ADVANCED 1.0
Version #: 01
Issue date: 27-July-2015
Revision date: -
Supersedes date: -
CAS #: Mixture
Product code: KAS_AGROADV1_CA_EN
Product use: Fertilizer Additive.

Manufacturer information
Manufacturer/Supplier: Koch Agronomic Services, LLC
4111 E 37th St N
Wichita, KS 67220 US
kochmsds@kochind.com
1.866.863.5550

Emergency
For Chemical Emergency
Call CHEMTREC day or night
USA/Canada - 1.800.424.9300
Mexico - 1.800.681.9531
Outside USA/Canada - 1.703.527.3887
(collect calls accepted)

2. Hazards Identification

Emergency overview
WARNING
Causes eye burns. Irritating to skin. May cause irritation to the respiratory system. Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Prolonged exposure may cause chronic effects.

Potential health effects
Routes of exposure
Inhalation. Ingestion. Skin contact. Eye contact.

Eyes
Causes eye burns. Avoid contact with eyes.

Skin
May cause skin irritation. Avoid contact with the skin.

Inhalation
May cause irritation of respiratory tract. Prolonged inhalation may be harmful.

Ingestion
Irritating. May cause nausea, stomach pain and vomiting.

Chronic effects
Sterility. Pregnant women or women of child-bearing age should not be exposed to this product. Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Signs and symptoms
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Symptoms may include redness, edema, drying, defatting and cracking of the skin. Birth defects. Sterility.

Potential environmental effects
May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components | CAS # | Percent
--- | --- | ---
N-methyl-2-pyrrolidone | 872-50-4 | 30 - 60
N-(n-butyl)-thiophosphoric triamide | 94317-64-3 | 15 - 40
Propane -1,2 -diol | 57-55-6 | 10 - 30
Triethylene glycol monobutyl ether | 143-22-6 | 1 - 5
Components | CAS # | Percent
--- | --- | ---
Non hazardous dye | Proprietary | <1

**Composition comments**

All concentrations are in percent by weight.

This Safety Data Sheet is not a guarantee of product specification or NPK value(s). NPK content is on specified sales orders, customer invoices, or product specification sheets obtained from supplier.

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**4. First Aid Measures**

**First aid procedures**

- **Inhalation**: Move to fresh air. Get medical attention, if needed.
- **Skin contact**: Remove and isolate contaminated clothing and shoes. Wash off immediately with soap and plenty of water. Get medical attention if irritation develops and persists.
- **Eye contact**: Flush eyes immediately with large amounts of water. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Continue rinsing. Get medical attention if irritation develops and persists.
- **Ingestion**: Rinse mouth thoroughly. Never give anything by mouth to a victim who is unconscious or is having convulsions. If ingestion of a large amount does occur, call a poison control center immediately. Do not induce vomiting without advice from poison control center.

**Notes to physician**

Symptoms may be delayed.

**General advice**

If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

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**5. Fire Fighting Measures**

**Flammable properties**

The product is not flammable.

**Extinguishing media**

- **Unsuitable extinguishing media**: Do not use water jet as an extinguisher, as this will spread the fire.

**Protection of firefighters**

- **Specific hazards arising from the chemical**: Fire may produce irritating, corrosive and/or toxic gases.
- **Protective equipment for firefighters**: Firefighters should wear full protective clothing including self contained breathing apparatus. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing should be worn when fighting chemical fires.

**Fire fighting equipment/instructions**

Use standard firefighting procedures and consider the hazards of other involved materials.

**Explosion data**

- **Sensitivity to static discharge**: No data available.
- **Sensitivity to mechanical impact**: No data available.

**Hazardous combustion products**


**General fire hazards**

The product is not flammable. Will burn if involved in a fire.

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**6. Accidental Release Measures**

**Personal precautions**

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. For personal protection, see section 8 of the MSDS.

**Environmental precautions**

Do not contaminate water.

**Methods for containment**

Stop leak if you can do so without risk. Use water spray to reduce vapors or divert vapor cloud drift. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.
Methods for cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Clean up in accordance with all applicable regulations. For waste disposal, see section 13 of the MSDS.

Other information

Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling

Avoid breathing mist or vapor. Avoid contact with skin. Avoid contact with eyes. Avoid prolonged exposure. When using do not eat or drink. Do not use in areas without adequate ventilation. Wash thoroughly after handling. Avoid release to the environment.

Storage

Store in a closed container away from incompatible materials. Use care in handling/storage. Store away from incompatible materials (see Section 10 of the MSDS).

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH Biological Exposure Indices

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-methyl-2-pyrrolidone (CAS 872-50-4)</td>
<td>BEI</td>
<td>100 mg/l</td>
</tr>
</tbody>
</table>

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-methyl-2-pyrrolidone (CAS 872-50-4)</td>
<td>TWA</td>
<td>400 mg/m3</td>
<td>Vapor and aerosol, inhalable fraction.</td>
</tr>
<tr>
<td>Propane -1,2 -diol (CAS 57-55-6)</td>
<td>TWA</td>
<td>155 mg/m3</td>
<td>Aerosol.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m3</td>
<td>Vapor and aerosol, inhalable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 ppm</td>
<td></td>
</tr>
</tbody>
</table>

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye / face protection
Wear safety glasses with side shields (or goggles).

Skin protection
Wear suitable protective clothing. Wear protective gloves.

Respiratory protection
Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

9. Physical & Chemical Properties

Appearance
Green liquid.

Physical state
Liquid.

Form
Liquid.

Color
Green.

Odor
Slight.

Odor threshold
Not available.

pH
8.1 - 8.6 in 10% solution

Vapor pressure
Not available.

Vapor density
Not available.

Boiling point
Not available.
Melting point/Freezing point Not available.
Solubility (water) Soluble.
Specific gravity Not available.
Flash point Not available.
Flammability limits in air, upper, % by volume Not available.
Flammability limits in air, lower, % by volume Not available.
Auto-ignition temperature Not available.
Evaporation rate Not available.
Viscosity 20 - 30 cP
Partition coefficient (n-octanol/water) Not available.
Other data Flammability (solid, gas) Not applicable.

10. Chemical Stability & Reactivity Information
Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability Stable under normal temperature conditions.
Conditions to avoid Contact with incompatible materials. Extreme temperatures.
Possibility of hazardous reactions Hazardous polymerization does not occur.

11. Toxicological Information
Toxicological data

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-(n-butyl)-thiophosphoric triamide (CAS 94317-64-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Wistar rat</td>
<td>&gt; 2.1 mg/l, 4 hours</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Wistar rat</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>N-methyl-2-pyrrolidone (CAS 872-50-4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 5000 mg/kg, 24 Hours</td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 5.1 mg/l, 4 Hours</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>4150 mg/kg</td>
</tr>
<tr>
<td>Propane -1,2 -diol (CAS 57-55-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>20800 mg/kg</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>22000 mg/kg</td>
</tr>
</tbody>
</table>
### Components

**Components** | **Species** | **Test Results**
--- | --- | ---
Triethylene glycol monobutyl ether (CAS 143-22-6)

#### Acute

- **Dermal**
  - LD50  
    - Rabbit: 3.54 ml/kg

- **Oral**
  - LD50  
    - Rat: 5300 mg/kg

#### Acute effects

- **Sensitization** Not available.
- **Chronic effects** Prolonged inhalation may be harmful.
- **Carcinogenicity** Not classifiable as to carcinogenicity to humans.
- **Skin corrosion/irritation** Irritating to skin.
- **Serious eye damage/irritation** Causes eye burns.
- **Mutagenicity** Not available.
- **Reproductive effects** Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility.
- **Teratogenicity** Not available.
- **Synergistic materials** Not available.

#### Further information

Reproductive toxicity. Symptoms may be delayed.

### 12. Ecological Information

#### Ecotoxicological data

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-(n-butyl)-thiophosphoric triamide (CAS 94317-64-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>EC50</td>
<td>Selenastrum capricornutum 280 mg/l, 96 hours</td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Daphnia magna 290 mg/l, 48 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Daphnia 350 mg/l, 48 hours</td>
</tr>
<tr>
<td></td>
<td>LC50</td>
<td>Lepomis macrochirus 1140 mg/l, 96 hours</td>
</tr>
<tr>
<td>N-methyl-2-pyrrolidone (CAS 872-50-4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>EC50</td>
<td>Scenedesmus subspicatus &gt; 500 mg/l, 72 hours</td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Daphnia magna &gt; 1000 mg/l, 24 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Oncorhynchus mykiss &gt; 500 mg/l, 96 hours</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50</td>
<td>Daphnia magna 25 mg/l, 21 days</td>
</tr>
<tr>
<td>Propane -1,2 -diol (CAS 57-55-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>EC50</td>
<td>Selenastrum capricornutum 19000 mg/l, 72 hours</td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50</td>
<td>Ceriodaphnia 18340 mg/l, 48 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Pimephales promelas 46500 mg/l, 96 hours</td>
</tr>
</tbody>
</table>

### Triethylene glycol monobutyl ether (CAS 143-22-6)

#### Aquatic

- **Acute**
  - Fish: LC50 Pimephales promelas 2400 mg/l, 96 hours

#### Ecotoxicity

Contains a substance which causes risk of hazardous effects to the environment.

#### Environmental effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
13. Disposal Considerations

Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information

TDG
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

15. Regulatory Information

Canadian regulations
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status
Controlled

WHMIS classification
D2A - Other Toxic Effects-Very Toxic
D2B - Other Toxic Effects-Toxic

16. Other Information

HMIS® ratings
Health: 2*
Flammability: 1
Physical hazard: 0

NFPA ratings
Health: 2
Flammability: 1
Instability: 0
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Prepared by
Koch Agronomic Services, LLC