



Crop Protection Inc.

Diquat 240g/L SL

## 1. IDENTIFICATION OF THE SUBSTANCE

**Product name:** Advantage Diquat 240

**Company Identification:**

Supplied by:

**Advantage Crop Protection Inc.**

601-402 21st East

Saskatoon, Saskatchewan

Canada

S7K 0C3

Phone: 1-888-931-2530

Emergency: 1-613-966-6666

**Product:** Advantage Diquat 240

**PCP #:** #33731

**Date Prepared:** December 2, 2020

**Preparer:** Advantage Crop Protection Inc.

**Telephone Number:** Emergency Number, Canutec 1-613-966-6666

**Product Use:** bipyridylium herbicide

## 2. HAZARD IDENTIFICATION

### Symptoms of Acute Exposure

Harmful if swallowed or inhaled. Irritating to eyes and skin.

### Hazardous Decomposition Products

Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10. Can decompose at high temperatures forming toxic gases.

### Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum. During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

### Potential Health Effects

Irritation of the mouth, pharynx, esophagus and stomach can develop following ingestion. The degree of injury will depend on the amount absorbed from the gut. Symptoms following ingestion of diquat concentrate may initially include nausea, vomiting, abdominal pain and severe irritation of the mouth, throat and esophagus. These can be followed by kidney failure

and other internal organ involvement.

This substance is considered slightly toxic by inhalation. The degree of injury will depend on the airborne concentration and duration of exposure. Diquat is a water-soluble salt which has no measurable vapour pressure. Therefore, inhalation hazard from diquat vapour is minimal. If the concentrate is spilled and allowed to stand, it can dry to a highly irritating dust. Symptoms of inhalation overexposure may include headache, nosebleed, sore throat and coughing.

This material is classified as "slightly toxic" by dermal absorption. The degree of injury will depend on the amount absorbed. Because diquat is an ionized compound, it has a slow rate of absorption through intact skin. Prolonged or repeated contact may result in skin damage, thus allowing more of the chemical to be absorbed. This could result in systemic poisoning as evidenced by injury to internal organs, primarily the kidneys. Short contact periods with human skin are not usually associated with skin irritation; repeated and/or prolonged contact can result in skin irritation. Repeated and/or prolonged contact may cause dermatitis.

This material may irritate human eyes following contact and could cause prolonged (weeks) impairment of vision. The degree of injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Symptoms may include pain, tearing, swelling, redness, and blurred vision.

**Relevant routes of exposure:** Skin, eyes, mouth, lungs.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient Name                         | CAS Number | Concentration (g/L) |
|---|------------|---------------------|
| Diquat ion<br>(calculated as dibromide) | 85-00-7    | 240g/L<br>(448.3)   |
| Other Inert Ingredients                 |            | 751.7               |

### 4. FIRST AID MEASURES

#### 4.1 Description of first aid measures

##### Eye Contact

Flush eyes with clean water, holding eyelids apart for a minimum of 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye.

##### Skin Contact

Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Flush skin with plenty of water for 15-20 minutes.

## Inhalation

Move victim to fresh air. If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

## Ingestion

If swallowed, immediately contact a poison control centre, doctor or nearest hospital for treatment advice. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water.

## Notes to Physician

To be effective, treatment for ingestion of the product must begin IMMEDIATELY. Treatment consists of binding the active ingredient, diquat, in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

## 5. FIRE-FIGHTING MEASURES

**Flash point and method:** Not applicable.

**Upper and lower flammable (explosive) limits in air:** Not applicable.

**Auto-ignition temperature:** Not applicable.

**Flammability:** Not flammable.

**Hazardous combustion products:** Carbon dioxide, carbon monoxide and, irritating and/or toxic gases, vapours or smoke.

**Conditions under which flammability could occur:** Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10. Keep fire exposed containers cool by spraying with water.

**Extinguishing media:** Use foam, carbon dioxide, dry powder or halon extinguishant. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. Contain run-off water with, for example, temporary earth barriers.

**Sensitivity to explosion by mechanical impact:** None known.

**Sensitivity to explosion by static discharge:** None known.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Wear suitable protective clothing and eye protection to prevent skin and eye contact. Use adequate ventilation and wear equipment and clothing as described in Section 8 and/or the product label.

**Procedures for dealing with release or spill:** Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage



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systems or any body of water. Clean up spills immediately, observing precautions outlined in Sections 7 and 8. Pump or scoop large amounts of liquid into a disposable container. Absorb remaining liquid or smaller spills with clay, sand or vermiculite. Scoop or sweep up material and place into a disposal container. Wash area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, small amounts will naturally decompose. For large amounts, skim off the upper contaminated layer and collect for disposal. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposal. Spillages or uncontrolled discharges into watercourses must be reported to the appropriate regulatory authority

**Deactivating Chemicals:** Bentonite, Fuller's Earth, Activated Charcoal.

## 7. HANDLING AND STORAGE

**Handling practices:** This product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or having aluminum fittings. KEEP OUT OF REACH OF CHILDREN. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Avoid breathing vapours or spray mist. If the concentrate is spilled and allowed to stand, it can dry to a highly irritating dust. Wear full protective clothing and equipment (see Section 8). After work, rinse gloves and remove protective equipment, and wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, applying cosmetics or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Protect product, wash or rinse water, and contaminated materials from uncontrolled release into the environment, or from access by animals, birds or unauthorized people.

**Appropriate storage practices/requirements:** Store in original container only in a well-ventilated, cool, dry, secure area. Protect from heat, sparks and flame. Do not expose sealed containers to temperatures above 40 °C. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately. **DO NOT STORE PRODUCT BELOW 0°C – avoid freezing product during winter storage.**

**National Fire Code classification:** Not required.

## 8. EXPOSURE CONTROL/PERSONAL PROTECTION

**Applicable control measures, including engineering controls:** Ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels below the TLV. Warehouses, production area, parking lots and waste holding facilities must have adequate containment to prevent environmental contamination. Provide separate shower and eating facilities.

**THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE**



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**CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT. CONSULT THE PRODUCT LABEL FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS.**

**Personal protective equipment for each exposure route:**

General: Avoid breathing dust, vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, applying cosmetics or handling tobacco.

**INGESTION:** Do not eat, drink, handle tobacco, or apply cosmetics in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

**EYES:** Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**SKIN:** Where contact is likely, wear chemical-resistant gloves (such as nitrile or butyl), coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

**INHALATION:** A respirator is not normally required when handling this substance. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P or R 95 or HE class filter and an organic vapour cartridge may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a pressure demand atmosphere-supplying respirator if there is any potential for uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

|   |                       |
|---|-----------------------|
| a) Appearance:                                  | Dark brown liquid     |
| b) Odour  | odorless              |
| c) Odour threshold                              | no data available     |
| d) pH value                                     | 4-8                   |
| e) Melting point/freezing point                 | Not Applicable        |
| f) Initial boiling point and boiling range      | no data available     |
| g) Flash point                                  | does not flash        |
| h) Evaporation rate                             | no data available     |
| i) Flammability (solid, gas)                    | not applicable        |
| j) Upper/lower flammability or explosive limits | not applicable        |
| k) Vapour pressure                              | no data available     |
| l) Vapour density                               | no data available     |
| m) Relative density                             | no data available     |
| n) Water solubility                             | soluble in/with water |
| o) Partition coefficient: noctanol /water       | no data available     |
| p) Autoignition temperature                     | not applicable        |

|                              |  |
|------------------------------|--|
| q) Decomposition temperature | no data available  |
| r) Viscosity                 | 1.4 mm <sup>2</sup> /s (cSt) (at 20.1°C)<br>1.1 mm <sup>2</sup> /s (cSt) (at 40.2°C) |
| s) Boiling point             | 102.7 °C at 715 mmHg   |
| t) Density                   | 1.19 g/ml at 20 °C   |

## 10. STABILITY AND REACTIVITY

**Chemical stability:** Stable under normal use and storage conditions.

**Conditions to avoid:** Concentrate should not be stored in aluminum containers. This product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or having aluminum fittings. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass.

**Incompatibility with other materials:** Strong alkalis and anionic wetting agents (e.g., alkyl and alkylaryl sulfonates).

Corrosive to aluminum.

**Hazardous decomposition products:** Flammable hydrogen gas may be formed on contact with aluminum. See

"Conditions to Avoid", Section 10. Can decompose at high temperatures forming toxic gases.

**Hazardous polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute studies

**Oral LD<sub>50</sub> (rat):** 886 mg/kg for female.

**Dermal LD<sub>50</sub> (rat):** ≥4000 mg/kg for male and female.

**Skin irritation(rat):** Slight irritant to rabbit skin.

**Eye irritation(rabbit):** Minimal irritant to rabbit eyes.

**Inhalation:** < 1.107mg/L

**Sensitization:** It is not a skin sensitiser in animal tests.

### Reproductive/Developmental Effects

Diquat dibromide:

Mutagenicity: No evidence with *in vivo* assays.

Development Toxicity: In rabbit studies a small percentage of fetuses had minor defects at 3 and 10 mg/kg/day.

### Chronic/Sub chronic Toxicity Studies

Diquat dibromide: Kidney weight decreases, and cataracts seen in dogs at 12.5 mg/kg/day. No evidence for neurotoxic effects in rats dosed up to 400 ppm in the diet for 13 weeks.



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## Carcinogenicity

Diquat dibromide: No evidence of carcinogenicity in rat and mouse studies.

## Other Toxicity Information:

None.

## Toxicity of Other Components

The acute toxicity test results reported in Section 11, above, for the finished product take into account any acute hazards related to the "other components" in the formulation.

**Other materials that show synergistic toxic effects together with the product:** None known.

## Target Organs

Active Ingredient

Diquat dibromide: Eye, kidney.

Not applicable.

## 12. ECOLOGICAL INFORMATION (based on active ingredient)

### Eco-Acute Toxicity

Acute toxicity to birds: Acute oral LD<sub>50</sub> for mallard ducks 155, partridges 295 mg/kg.

Acute toxicity to fish: LC<sub>50</sub> (96 h) for rainbow trout 39, mirror carp 125 mg/l.

Acute toxicity to daphnia: LC<sub>50</sub> (48 h) 2.2g/l.

Acute toxicity to algae: EC<sub>50</sub> (96 h) 21g/l.

Acute toxicity to bees: LD<sub>50</sub> (oral, 120 h) 22g/bee.

Acute toxicity to worms: LC<sub>50</sub> (14 d) 243mg/kg.

### Eco-Chronic Toxicity

Diquat dibromide:

Invertebrates (Water Flea) 21-Day NOEC 50.0 ppm

Fish (Fathead) Early Life Stage NOEC 0.12 ppm

### Environmental Fate

The active ingredient, diquat dibromide, has a low bioaccumulation potential, low mobility and high persistence in soil, but is non-persistent in water. Hydrolysis and evaporation are not significant. photolysis is significant on vegetation. Under field conditions, diquat dibromide is almost immediately bound to soil or vegetation. Tightly bound residues are not biologically available, so the herbicide is deactivated on soil, and bound residues are resistant to microbial degradation. The soil dissipation half-life exceeds 3 years. Dissipation half-life in water is 1-2 days as the material is bound to sediment and deactivated.

For Reglone, the bulk material sinks in water (after 24 h).

## 13. DISPOSAL CONSIDERATIONS

**Waste disposal information:** Do not reuse empty containers unless they are specifically designed to be re-filled. Empty container retains product residue. Dispose of empty

containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal. Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

## 14. TRANSPORT INFORMATION

### Ground Transport- NAFTA:

Proper Shipping name: Corrosive liquid N.O.S (diquat bromide)

Hazard Class: 8

ID Packing Number UN 1760

Packing Group PG III

Label Statement: B/L Freight Classification-Herbicides, NOI (NMC Class 60)

### Water Transportation - International

Proper Shipping name: Corrosive liquid N.O.S (diquat bromide)

Hazard Class: 8

ID Packing Number UN 1760

Packing Group PG III

### Air Transportation- International

Proper Shipping name: Corrosive liquid N.O.S (diquat bromide)

Hazard Class: 8

ID Packing Number UN 1760

Packing Group PG III

Label Statements: Passenger - 818, Cargo – 820

Packaging Limitations: Inner packages over 5 liters and single packages over 60 liters cannot be shipped by cargo aircraft. Inner packages over 2.5 liters and outer packages over 5 liters cannot be shipped by passenger aircraft.

## 15. REGULATORY INFORMATION

Local regulations if any should be applied to classification and labeling.

## 16. OTHER INFORMATION

This information is provided in good faith but without express or implied warranty. Buyer assumes all responsibility for safety and use not in accordance with label instruction.