MSDS: Ofloxacin Ophthalmic Solution, USP, 0.3%

Material Safety Data Sheet
Manufacturer: Akorn Incorporated
150 South Wyckles Road
Decatur, IL 62522
Telephone: 1-800-932-5676
Email: customer.service@akorn.com

Section 1 – IDENTIFICATION

TRADE NAME: Ofloxacin Ophthalmic Solution, USP, 0.3%
Description: Sterile, anti-infective for topical ophthalmic use

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS #</th>
<th>TLV (mg/m³)</th>
<th>PEL (mg/m³)</th>
<th>% Content</th>
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</thead>
<tbody>
<tr>
<td>Ofloxacin, USP</td>
<td>82419-36-1</td>
<td>Not Established</td>
<td>Not Established</td>
<td>0.3</td>
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<tr>
<td>Benzalkonium Chloride, NF</td>
<td>8001-54-5</td>
<td>Not Established</td>
<td>Not Established</td>
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<tr>
<td>Sodium Chloride, USP / EP</td>
<td>7647-14-5</td>
<td>Not Established</td>
<td>Not Established</td>
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<tr>
<td>Hydrochloric Acid, NF</td>
<td>7647-01-0</td>
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<td>Not Established</td>
<td>qs</td>
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<td>Sodium Hydroxide, NF</td>
<td>1310-73-2</td>
<td>Not Established</td>
<td>Not Established</td>
<td>qs</td>
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<tr>
<td>Water for Injection, USP</td>
<td>7732-18-5</td>
<td>Not Established</td>
<td>Not Established</td>
<td>qs</td>
</tr>
</tbody>
</table>

Ofloxacin Ophthalmic Solution, USP, 0.3% is supplied sterile in two presentations of 5mL fill/10cc and 10mL fill/10cc, within plastic dropper bottles suitable for dispensing into the eye.

Common name of active ingredient: Ofloxacin
Molecular Formula: C₁₈H₂₀FN₃O₄
Molecular Weight: 361.37 g/mole
Legal Category: Prescription Only

Section 2 – HAZARDOUS IDENTIFICATION

******************************************************************************
EMERGENCY OVERVIEW
Presents little or no hazards if spilled and no unusual hazard if involved in fire.
******************************************************************************
POTENTIAL HEALTH HAZARDS
Carcinogenicity: (NTP) No (IARC) No (OSHA) No
Eye: May irritate the eyes
Ingestion: No data
Inhalation: May irritate the respiratory tract
Skin: Ofloxacin should be discontinued at the first appearance of a skin rash or any other sign of hypersensitivity reaction.
Target Organ: None
Medical Conditions Aggravated by Long Term Exposure: The systemic administration of quinolones, including ofloxacin, has led to lesions or erosions of the cartilage in weight-bearing joints and other signs of arthropathy in immature animals of various species. Ofloxacin, administered systemically at 10 mg/kg/day in young dogs (equivalent to 110 times the maximum recommended daily adult ophthalmic dose) has been associated with these types of effects. Quinolones, including ofloxacin, have been shown to cause arthropathy in immature animals after oral administration; however, topical ocular administration of ofloxacin to immature animals has not shown any arthropathy. There is no evidence that the ophthalmic dosage form of ofloxacin has any effect on weight bearing joints.

Section 3 – PHYSICAL AND CHEMICAL CHARACTERISTICS

Appearance: Clear, pale yellow to yellow solution
Boiling Point: Not available
Vapor Density (air = 1): Not available
Vapor Pressure (mm Hg): Not available
Viscosity: Aqueous
Solubility in Water: Completely miscible
Specific Gravity: ~ 1.008 @ 25°C
Volatile Component: Less than 1%
Evaporation Rate: Not available
Reactivity in Water: Not reactive
pH: 6.2 to 6.8
Latex Free: Yes

Section 4 – FIRE AND EXPLOSION HAZARD DATA

Flammable Properties: Flash point: Not Established  Method: Not Established
Extinguisher Media: Use extinguishing media suitable for surrounding materials such as dry chemical, carbon dioxide, halon, water spray or fog, and foam
Hazardous Products: Products of combustion may be toxic
Explosion: None
Fire Fighting Instructions: Firefighters should use self-contained breathing equipment with full facepiece operated in pressure-demand or positive-pressure mode and protective clothing.

Section 5 – REACTIVITY DATA

Stability: Stable from a safety point of view
Conditions to avoid: Extreme heat or cold
Incompatibility: Similar to water e.g. strong acids, bases, alkali metals, alkali hydrides and silver preparations
Hazardous Decomposition Products: Products of combustion may be toxic
Hazardous Polymerization: Will not occur
Section 6 – FIRST AID MEASURES

Eyes: Contact a physician.
Skin: Remove contaminated clothing and wash skin with copious amounts of water. Discontinue use and contact a physician if skin becomes irritated.
Ingestion: Wash out mouth and drink plenty of water. The use of an emetic drug and/or gastric lavage is advisable. Do not give anything to an unconscious person. Contact a physician.
Inhalation: Remove person to fresh air, and if breathing stops, use artificial respiration. Contact physician.

Note to Physicians: Additional details are available on the package insert or in the Physicians Desk Reference.

Section 7 – SPECIAL PRECAUTIONS AND SPILL / LEAK PROCEDURES

Storage: Store the product in original container with the cap tightly closed at a controlled room temperature 15° to 25°C (59° to 77°F). KEEP THIS AND ALL DRUGS OUT OF THE REACH OF CHILDREN
Handling: Avoid contact with product and use caution to prevent puncturing containers. No special protective equipment or procedures are required in the clinical or home environment. Wash thoroughly after handling. Contaminated clothing should be laundered before reuse.
Neutralizing Chemical Agent: Not relevant
Steps to be taken in case material is released or spilled: Spills may be absorbed with a wet disposable towel or other suitable adsorbant. Carefully collect and place in a suitable, properly labeled container for disposal. Clean area using soap and water.
Waste Disposal Methods: Disposal should be conducted in accordance with local, state and federal environmental regulations. Incineration is recommended.

Section 8 – PROTECTION INFORMATION

Engineering Control: Adequate ventilation is recommended
Skin Protection: Rubber gloves and protective clothing such as a laboratory coat or apron appropriate for the work situation
Eye Protection: Safety goggles. Emergency eyewash should be available.
Respiratory Protection: No protection is required in the clinical or home environment. If exposure to mist is possible, wear a NIOSH-approved respirator equipped with a dust/mist filter.
Contaminated Equipment: Wash contaminated clothing and equipment thoroughly with soap and water. Release rinse water into an approved waste water system or according to Federal, State and Local regulations.
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### Section 9 – TOXICOLOGY INFORMATION

**Toxicity:** Concentration and toxicological effects are substantially reduced in the ophthalmic drug product. Toxicological information presented here refers to the active pharmaceutical ingredient raw material. For more detailed information, see MSDS for Ofloxacin (CAS # 82419-36-1). It may be irritating to the eye/nose/throat and cause asthenia, malaise, seizures, anxiety, cognitive change, vertigo, cough, bronchospasms, tachycardia, syncope, hepatic dysfunction, kidney dysfunction, and hypersensitivity reactions.

**Acute oral toxicity:**
- $LD_{50}$ (oral, male rats) = 3,590 mg/kg
- $LD_{50}$ (oral, male mice) = 5,450 mg/kg
- $TDLo$ (oral, male) = 17 mg/kg/d
- $LD_{50}$ (oral, female rats) = 3,750 mg/kg
- $LD_{50}$ (oral, female mice) = 5,290 mg/kg
- $TDLo$ (oral, female) = 24 mg/kg/d

**Intravenous toxicity:**
- $LD_{50}$ (oral, male rats) = 273 mg/kg
- $LD_{50}$ (oral, male mice) = 208 mg/kg
- $LD_{50}$ (oral, female rats) = 276 mg/kg
- $LD_{50}$ (oral, female mice) = 233 mg/kg

**Subcutaneous toxicity:**
- $LD_{50}$ (oral, male rats) = 7,070 mg/kg
- $LD_{50}$ (oral, male mice) > 10,000 mg/kg
- $LD_{50}$ (oral, female rats) = 9,000 mg/kg
- $LD_{50}$ (oral, female mice) > 10,000 mg/kg

**Reproductive toxicity:**
- Embryotoxicity in rats = 160 mg/kg/d
- Embryotoxicity in rabbits = 810 mg/kg/d
- Not teratogenic in rats and rabbits at 810 mg/kg/d

**Carcinogenesis, Mutagenesis, Impairment of Fertility:** Long-term studies to determine the carcinogenic potential of ofloxacin have not been conducted. Ofloxacin was not mutagenic in the Ames test, *in vitro* and *in vivo* cytogenetic assay, sister chromatid exchange assay (Chinese hamster and human cell lines), unscheduled DNA synthesis (UDS) assay using human fibroblasts, the dominant lethal assay, or mouse micronucleus assay. Ofloxacin was positive in the UDS test using rat hepatocyte, and in the mouse lymphoma assay. In fertility studies in rats, ofloxacin did not affect male or female fertility or morphological or reproductive performance at oral dosing up to 360 mg/kg/day (equivalent to 4000 times the maximum recommended daily ophthalmic dose).

**Pregnancy:** Pregnancy category C Ofloxacin has been shown to have an embryocidal effect in rats and in rabbits when given in doses of 810 mg/kg/day (equivalent to 9000 times the maximum recommended daily ophthalmic dose) and 160 mg/kg/day (equivalent to 1800 times the maximum recommended daily ophthalmic dose). These dosages resulted in decreased fetal body weight and increased fetal mortality in rats and rabbits, respectively. Minor fetal skeletal variations were reported in rats receiving doses of 810 mg/kg/day. Ofloxacin has not been shown to be teratogenic at doses as high as 810 mg/kg/day and 160 mg/kg/day when administered to pregnant rats and rabbits, respectively.

**Nursing Mothers:** In nursing women a single 200mg oral dose resulted in concentrations of ofloxacin in milk which were similar to those found in plasma. It is not known whether ofloxacin is excreted in human milk following topical ophthalmic administration. Because of the potential for serious adverse reactions from ofloxacin in nursing infants, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.
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Drug Interactions: Specific drug interaction studies have not been conducted with ofloxacin ophthalmic solution. However, the systemic administration of some quinolones has been shown to elevate plasma concentrations of theophylline, interfere with the metabolism of caffeine, and enhance the effects of the oral anticoagulant warfarin and its derivatives, and, has been associated with transient elevations in serum creatinine in patients receiving cyclosporine concomitantly.

Section 10  – ECOLOGICAL INFORMATION

Environmental fate information: Product as administered to patients presents a negligible impact on the environment.

Section 11  – REGULATORY INFORMATION

DOT Designations: Not classified as hazardous by DOT regulations
EPA Designations: RCRA Hazardous Waste (40 CFR 261.33) Not Listed
FDA Designations: Prescription only medication
NDC 17478-713-10 (5 mL ophthalmic bottle)
NDC 17478-713-11 (10 mL ophthalmic bottle)
OSHA Designations: (29 CFR 1910.1000, Table Z) Not Listed
SARA Title III: Not listed under Section 313 of Toxic Release Reporting.
CALIFORNIA PROPOSITION 65: Not Listed

Section 12  – OTHER INFORMATION

The information given herein is in good faith and to the best of our knowledge but no warranty, expressed or implied, is made.

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