Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Koagulon Vitamin K1 Injection

SYNONYMS
"Koagulon Injection"

PRODUCT USE
For the treatment of coagulopathies associated with coumarin, warfarin and indanedione poisoning in dogs and cats, and sweet clover (dicoumarol) poisoning in horses and cattle. For the prevention and treatment of haemorrhage due to reduced hepatic synthesis of clotting factors.

New Zealand - Restricted Veterinary Medicine, this product may be given only by, or under the supervision of, a registered veterinary surgeon.

Do not use on pregnant animals. Do not use if separation or oil droplets have appeared. Only administer by intravenous injection in cases of potentially fatal haemorrhage.

SUPPLIER
Company: IAH Sales Pty Ltd
Address:
18 Healey Circuit
Huntingwood
NSW 2148
Australia
Telephone: 61 2 9672 7944
Emergency Tel: 61 2 9672 7944 (If unable to contact the company, contact the Poison Information Centre 131 126 (Australia).
Fax: 61 2 96727988
Email: info@iahp.com.au

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Toxicity</th>
<th>Body Contact</th>
<th>Reactivity</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SCALE: Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4

continued...
Koagulon Vitamin K1 Injection

Section 2 - HAZARDS IDENTIFICATION

RISK
• None under normal operating conditions.

SAFETY
• None under normal operating conditions.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>phytomenadione</td>
<td>84-80-0</td>
<td>&lt;5</td>
</tr>
<tr>
<td>other ingredients not contributing to the classification</td>
<td>balance</td>
<td></td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED
• Immediately give a glass of water.
• First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

EYE
■ If this product comes in contact with the eyes:
  • Wash out immediately with fresh running water.
  • Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  • Seek medical attention without delay; if pain persists or recurs seek medical attention.
  • Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
■ If skin or hair contact occurs:
  • Flush skin and hair with running water (and soap if available).
  • Seek medical attention in event of irritation.

INHALED
• If fumes, aerosols or combustion products are inhaled remove from contaminated area.
• Other measures are usually unnecessary.

NOTES TO PHYSICIAN
Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
■ The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas.

FIRE FIGHTING
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves in the event of a fire.
• Prevent, by any means available, spillage from entering drains or water courses.
• Use fire fighting procedures suitable for surrounding area.

FIRE/EXPLOSION HAZARD
• The material is not readily combustible under normal conditions.
• However, it will break down under fire conditions and the organic component may burn.
• Not considered to be a significant fire risk.
• Heat may cause expansion or decomposition with violent rupture of containers.

May emit poisonous fumes.

continued...
Koagulon Vitamin K1 Injection

Section 5 - FIRE FIGHTING MEASURES

May emit corrosive fumes.

FIRE INCOMPATIBILITY

■ None known.

HAZCHEM

None

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
• Clean up all spills immediately.
• Avoid breathing vapours and contact with skin and eyes.
• Control personal contact with the substance, by using protective equipment.
• Contain and absorb spill with sand, earth, inert material or vermiculite.

MAJOR SPILLS
Moderate hazard.
• Clear area of personnel and move upwind.
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves.
• Prevent, by any means available, spillage from entering drains or water course.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
• Avoid all personal contact, including inhalation.
• Wear protective clothing when risk of exposure occurs.
• Use in a well-ventilated area.
• Prevent concentration in hollows and sumps.

SUITABLE CONTAINER
• Check that containers are clearly labelled.
• Packaging as recommended by manufacturer.
20mL amber glass bottle with rubber septum and aluminium seal.

STORAGE INCOMPATIBILITY
None known.

STORAGE REQUIREMENTS
• Store in original containers.
• Keep containers securely sealed.
• Store in a cool, dry, well-ventilated area.
• Store away from incompatible materials and foodstuff containers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS
The following materials had no OELs on our records
• phytonadione: CAS:84- 80- 0

MATERIAL DATA
KOAGULON VITAMIN K1 INJECTION:
Odour Threshold Value for phenol: 0.060 ppm (detection)
NOTE: Detector tubes for phenol, measuring in excess of 1 ppm, are commercially available.

continued...
Systemic absorption by all routes may induce convulsions with damage to the lungs and central nervous system. <\>.

PHYTOMENADIONE:
Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations.

Airborne particulate or vapour must be kept to levels as low as is practicably achievable given access to modern engineering controls and monitoring hardware. Biologically active compounds may produce idiosyncratic effects which are entirely unpredictable on the basis of literature searches and prior clinical experience (both recent and past).

PERSONAL PROTECTION

RESPIRATOR
• Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE
■ No special equipment for minor exposure i.e. when handling small quantities.
• OTHERWISE:
  • Safety glasses with side shields.
  • Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET
■ No special equipment needed when handling small quantities.
OTHERWISE: Wear chemical protective gloves, e.g. PVC.

OTHER
■ No special equipment needed when handling small quantities.
OTHERWISE:
• Overalls.
• Barrier cream.
• Eyewash unit.

ENGINEERING CONTROLS
■ None required when handling small quantities.
OTHERWISE:
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Clear to slightly hazy, yellow-orange coloured oily liquid with an odour of phenol; does not mix with water.

PHYSICAL PROPERTIES
Liquid.
Does not mix with water.
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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular Weight</td>
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<tr>
<td>Melting Range (°C)</td>
<td>Not Available</td>
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<tr>
<td>Viscosity</td>
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<tr>
<td>Boiling Range (°C)</td>
<td>Not Available</td>
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<tr>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
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<tr>
<td>Flash Point (°C)</td>
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<tr>
<td>pH (1% solution)</td>
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</tr>
<tr>
<td>Decomposition Temp (°C)</td>
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<tr>
<td>pH (as supplied)</td>
<td>5.0-7.5</td>
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<tr>
<td>Autoignition Temp (°C)</td>
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<tr>
<td>Vapour Pressure (kPa)</td>
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<tr>
<td>Upper Explosive Limit (%)</td>
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<tr>
<td>Specific Gravity (water=1)</td>
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<tr>
<td>Lower Explosive Limit (%)</td>
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<tr>
<td>Relative Vapour Density (air=1)</td>
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<tr>
<td>Volatile Component (%vol)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Section 10 - STABILITY AND REACTIVITY

 CONDITIONS CONTRIBUTING TO INSTABILITY
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
• The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (eg. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE
• There is some evidence to suggest that this material can cause eye irritation and damage in some persons.
Non-ionic surfactants can cause numbing of the cornea, which masks discomfort normally caused by other agents and leads to corneal injury. Irritation varies depending on the duration of contact, the nature and concentration of the surfactant.

SKIN
• The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives.
One of the mechanisms of skin irritation caused by surfactants is considered to be denaturation of the proteins of skin. It has also been established that there is a connection between the potential of surfactants to denature protein in vitro and their effect on the skin.
Open cuts, abraded or irritated skin should not be exposed to this material.
Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
• The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
Not normally a hazard due to non-volatile nature of product.

CHRONIC HEALTH EFFECTS
• There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

TOXICITY AND IRRITATION
• No significant acute toxicological data identified in literature search.

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Section 11 - TOXICOLOGICAL INFORMATION

SKIN

phytomenadione GESAMP/EHS Composite List - GESAMP Hazard Profiles D1: skin irritation/corrosion (1)

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>phytomenadione</td>
<td>HIGH</td>
<td>No Data Available</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Section 13 - DISPOSAL CONSIDERATIONS

- Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area.
- A Hierarchy of Controls seems to be common - the user should investigate:
  - Reduction.
  - DO NOT allow wash water from cleaning or process equipment to enter drains.
  - It may be necessary to collect all wash water for treatment before disposal.
  - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
  - Where in doubt contact the responsible authority.
  - Recycle wherever possible.
  - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
  - Dispose of by: burial in a land-fill specifically licenced to accept chemical and/or pharmaceutical wastes or incineration in a licenced apparatus (after admixture with suitable combustible material).
  - Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:
None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE
None

REGULATIONS

Regulations for ingredients

phytomenadione (CAS: 84-80-0) is found on the following regulatory lists:
"Australia Inventory of Chemical Substances (AICS)", "Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO", "IMO Provisional Categorization of Liquid Substances - List 3: (Trade-named) mixtures containing at least 99% by weight of components already assessed by IMO, presenting safety hazards", "Sigma-AldrichTransport Information"
Section 16 - OTHER INFORMATION

- Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

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Print Date: 23-Oct-2013

This is the end of the MSDS.