SECTION-1: Identification of the substance / mixture and the company / undertaking

Catalogue Number	CS-ED-00974
Product Name	Avoparcin
CAS No.	37332-99-3
Category	API
Synonyms	(1S,2R,18R,19R,22S,25R,28R,40S)-2-[(2R,4R,5R,6S)-4-amino-5-hydroxy-6-methyloxan-2-yl]oxy-48-[(2S,4S,5S,6R)-3-[(2R,4R,5R,6S)-4-amino-5-hydroxy-6-methyloxan-2-yl]oxy-4,5-dihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy-5-chloro-18,32,35,37-tetrahydroxy-22-(4-hydroxyphenyl)-19-[[(2R)-2-(methylamino)-2-[4-[(2S,3R,4R,5R,6S)-3,4,5-trihydroxy-6-methyloxan-2-yl]oxyphenyl]acetyl]amino]-20,23,26,42,44-pentaoxo-7,13-dioxa-21,24,27,41,43-pentazaoctacyclo[26.14.2.23,6.214,17.18,12.129,33.010,25.034,39]pentaconta-3,5,8,10,12(48),14(47),15,17(46),29(45),30,32,34(39),35,37,49-pentadecaene-40-carboxylic acid
Brand	Clearsynth Labs Ltd.
Identified uses	Laboratory Chemicals
Uses advised against	Not available
Company	Clearsynth Labs Ltd. Mumbai, India
Emergency Phone #	+91-22-245045900
REACH No.	Not available

SECTION 2: Hazards identification

Disclaimer: This is sample MSDS. Please email **sales@clearsynth.com** for more details.

2.1 Classification of the substance or mixture-Regulation (EC) No 1272/2008:

Not available

2.2 Label Elements

Signal Word: Not available

Not available

Hazard Statement(s)

Code	Statement
Not available	Not available

Precautionary Statement(s)

Code	Statement
Not available	Not available

SECTION 3: Composition / information on ingredients

3.1 Substance

Component : Avoparcin
CAS Number : 37332-99-3
Molecular Formula : C83H92ClN9O31
Molecular Weight : 1747.1
Parent Chemical : Not available
Synonyms : (1S,2R,18R,19R,22S,25R,28R,40S)-2-[(2R,4R,5R,6S)-4-amino-5-hydroxy-6-methyloxan-2-yl]oxy-48-[(2S,4S,5S,6R)-3-[(2R,4R,5R,6S)-4-amino-5-hydroxy-6-methyloxan-2-yl]oxy-4,5-dihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy-5-chloro-18,32,35,37-tetrahydroxy-22-(4-hydroxyphenyl)-19-[[(2R)-2-(methylamino)-2-[4-[(2S,3R,4R,5R,6S)-3,4,5-trihydroxy-6-methyloxan-2-yl]oxyphenyl]acetyl]amino]-20,23,26,42,44-pentaoxo-7,13-dioxa-21,24,27,41,43-pentazaoctacyclo[26.14.2.23,6.214,17.18,12.129,33.010,25.034,39]pentaconta-3,5,8,10,12(48),14(47),15,17(46),29(45),30,32,34(39),35,37,49-pentadecaene-40-carboxylic acid
Concentration : Not available

SECTION 4: First aid measures

SECTION 4: First-aid measures

4.1 Description of first aid measures
General advice: Seek medical attention if symptoms occur or persist. Show this SDS to the physician.
Inhalation: Move person to fresh air. If breathing is difficult, seek medical attention.
Skin contact: Wash with soap and water. Remove contaminated clothing and wash before reuse. Seek medical attention if irritation develops.
Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical attention if irritation persists.
Ingestion: Rinse mouth. Do not induce vomiting unless directed by medical personnel. Seek medical attention.

4.2 Most important symptoms/effects, acute and delayed
Not available.

4.3 Indication of immediate medical attention and special treatment needed
Treat symptomatically. No data available.

SECTION 5: Firefighting measures

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media
Use extinguishing media appropriate for surrounding fire (water spray, dry chemical, foam, or carbon dioxide).

5.2 Special hazards arising from the substance or mixture

No data available. Combustion may produce carbon oxides, nitrogen oxides, and hydrogen chloride and/or other chlorine-containing fumes.

5.3 Advice for firefighters
Wear self-contained breathing apparatus and full protective gear. Avoid inhalation of combustion products. Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing dust. Use appropriate personal protective equipment.

6.2 Environmental precautions
Avoid release to the environment. Prevent entry into drains, surface waters, or soil.

6.3 Methods and materials for containment and cleaning up
Contain spill. Sweep up or collect using methods that minimize dust generation and place in a suitable, closed container for disposal. Clean spill area with water and detergent as appropriate.

6.4 Reference to other sections
See Section 8 for personal protective equipment and Section 13 for disposal considerations.

SECTION-7: Handling and storage

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid breathing dust/aerosols. Use local exhaust ventilation where dust may be generated.

7.2 Conditions for safe storage, including any incompatibilities
Store in a tightly closed container in a cool, dry, well-ventilated place. Protect from moisture. Incompatibilities: Not available.

7.3 Specific end use(s)
API / laboratory and research use. No further information available.

SECTION 8: Exposure controls / personal protection

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Occupational exposure limits: Not available.
Biological limit values: Not available.

8.2 Exposure controls
Engineering controls: Use adequate general ventilation. Use local exhaust to control airborne dust where generated.
Personal protective equipment (PPE):
- Eye/face protection: Safety glasses with side shields or chemical splash goggles.
- Skin protection: Protective gloves. Protective clothing as appropriate.

- Respiratory protection: If ventilation is inadequate or dust is generated, use a suitable particulate respirator.
Hygiene measures: Wash hands after handling. Do not eat, drink, or smoke when using this product.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Test	Result
Appearance	No data available
IR spectrum	No data available
pH	No data available
Solubility	No data available

Property	Value
a) Physical State	No data available
b) Color	No data available
c) Odor	No data available
d) pH	No data available
e) Vapour Pressure	No data available
f) Viscosity	No data available
g) Initial Boiling Point and boiling range	No data available
h) Melting Point / Freezing Point	No data available
i) Auto Ignition Temperature	No data available
j) Flash Point	No data available
k) Explosion Limit, Lower	No data available
l) Explosion Limit, Upper	No data available
m) Decomposition Temperature	No data available
n) Loss on Drying	No data available
o) Relative Density	No data available
p) Solubility (in DMSO)	No data available
q) Oxidizing Properties	No data available

SECTION 10: Stability and reactivity

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available.

10.4 Conditions to avoid
Avoid dust formation and exposure to moisture. Avoid excessive heat.

10.5 Incompatible materials
Not available.

10.6 Hazardous decomposition products
No data available. Thermal decomposition may produce carbon oxides, nitrogen oxides, and hydrogen chloride and/or other chlorine-containing compounds.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
- Acute toxicity: IDENTIFICATION AND USE: Avoparcin is an antimicrobial antibiotic that has been widely used in feed for poultry, pigs, calves, cattle for fattening and lambs, due to its positive effects on animal growth. At the time since vancomycin was not widely used, there was little reason to be concerned about resistance problems in humans. Things changed, however, when vancomycin became critical in human medicine for treatment of methicillin-resistant Staphylococcus aureus (MRSA) and other serious infections. Resistance to vancomycin, especially among enterococci (VRE) became an important public health problem in many countries. Researchers identified VRE in animals exposed to avoparcin, where they were not found in animals in countries where avoparcin was not used as a growth promoter. Furthermore, the prevalence of VRE among non-hospitalized people in the community was much higher in countries that used avoparcin. There is evidence that VRE in food animals may have been a reservoir for resistance in humans, perhaps through exchange of genetic material between animal and human strains, or through transient colonization of the human gut by animal strains. Avoparcin was never approved for use in the United States and its use has been banned in the European Union since 1997.HUMAN EXPOSURE AND TOXICITY: A case of contact dermatitis in a 50 year old woman resulted from exposure to avoparcin. ANIMAL STUDIES: Studies have shown an association between the use of the glycopeptide antibiotic avoparcin as a growth promoter and the occurrence of Enterococcus faecium (VREF) with high-level resistance to vancomycin on poultry and pig farms. The investigations were conducted as retrospective cohort studies, where groups of farms exposed or not exposed to avoparcin were compared. In poultry, the association between the use of avoparcin and the occurrence of VREF was confounded by the use of broad-spectrum antibiotics. In pigs, the association had a similar magnitude. The similar findings in the two studies provide evidence in favor of a causal association between the use of avoparcin and the occurrence of VREF on farms, and suggest that food animals constitute a potential reservoir of infection for VREF in humans. /OTHER TOXICITY INFORMATION/ With the exception of flavomycin & olaquindox, the antibiotics currently used in European countries as feed additives exert a Gram-positive spectrum of activity. Of these, tylosin & virginiamycin are known for cross-resistance to macrolides, lincosamidines & streptogramines, & avoparcin is known for cross-resistance to vancomycin & teicoplanin. The use of avoparcin in animal husbandry

creates a potential reservoir of transferable, vanA-mediated glycopeptide resistance in enterococci. A study in a rural area in Germany where vancomycin-resistant enterococci (VRE) were not isolated from infected humans but found in animal husbandry has shown that VRE are disseminated via meat products & are also found in fecal samples of non-hospitalized humans. VRE of different ecological origin from Germany (hospitals, sewage, food, animal husbandry) are polyclonal as evidenced by macrorestriction patterns & multilocus enzyme electrophoresis, suggesting a wide dissemination of the vanA gene cluster. These results confirm earlier observations on the spread of the sat genes, which confer resistance to a streptothricin antibiotic which has only been used in animal feeding. The resistance determinants were later also found in Escherichia coli from human infections & had spread in the absence of selective pressure.
- Skin corrosion/irritation: No data available.
- Serious eye damage/eye irritation: No data available.
- Respiratory or skin sensitization: /CASE REPORTS/ A case of contact dermatitis resulting from exposure to avoparcin was described. A 50 year old housewife with a 15 month history of erythema and pruritus on the skin under her corset was examined at a Spanish dermatology clinic. Previous patch testing had yielded positive reactions to nickel and cobalt. Treatment with topical corticosteroids and oral antihistamines at the time had produced little improvement. Examination revealed erythema and pruritus with slight scaling and well defined borders on the skin under her brassiere. Further patch testing confirmed her allergies to nickel and cobalt. Since she had mentioned helping her husband with farm work, she was also patch tested with samples of animal feed and their components. This produced positive reactions to avoparcin, a veterinary antibiotic, and to cobalt. An atomic absorption spectrophotometric analysis of her corset and brassiere detected 70 parts per million cobalt. Analysis of a new brassiere of the same brand and type did not detect cobalt. Wearing the new brassiere while not doing farm work caused no skin problems. The authors conclude that sensitization to cobalt alone does not appear to be the cause of the dermatitis of the patient. Avoparcin may be an additional important factor in her dermatitis.
- Germ cell mutagenicity: No data available.
- Carcinogenicity: No data available.
- Reproductive toxicity: No data available.
- STOT-single exposure: No data available.
- STOT-repeated exposure: No data available.
- Aspiration hazard: No data available.

Likely routes of exposure
- No data available.

Symptoms related to the physical, chemical and toxicological characteristics
- IDENTIFICATION AND USE: Avoparcin is an antimicrobial antibiotic that has been widely used in feed for poultry, pigs, calves, cattle for fattening and lambs, due to its positive effects on animal growth. At the time since vancomycin was not widely used, there was little reason to be concerned about resistance problems in humans. Things changed, however, when vancomycin became critical in human medicine for treatment of methicillin-resistant Staphylococcus aureus (MRSA) and other serious infections. Resistance to vancomycin, especially among enterococci (VRE) became an important public health problem in many countries. Researchers identified VRE in animals exposed to avoparcin, where they were not found in animals in countries where avoparcin was not used as a growth promoter. Furthermore, the prevalence of VRE among non-hospitalized people in the community was much higher in countries that used avoparcin. There is evidence that VRE in food animals may have been a reservoir for resistance in humans, perhaps through exchange of genetic material between animal and human strains, or through transient colonization of the human gut by animal strains. Avoparcin was never approved for use in the United States and its use has been banned in the European Union since 1997.HUMAN EXPOSURE AND TOXICITY: A case of contact dermatitis in a 50 year old woman resulted from exposure to avoparcin. ANIMAL STUDIES: Studies have shown an

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SECTION 12: Ecological information

SECTION 12: Ecological information

12.1 Toxicity
Not available.

12.2 Persistence and degradability
Not available.

12.3 Bioaccumulative potential
Not available.

12.4 Mobility in soil
Not available.

12.5 Results of PBT and vPvB assessment
Not available.

12.6 Endocrine disrupting properties
Not available.

12.7 Other adverse effects
Not available.

SECTION 13: Disposal considerations

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Dispose of contents/container in accordance with local/regional/national/international regulations. Do not discharge to drains.
Contaminated packaging: Dispose of as unused product.
Waste codes: Not available.

SECTION 14: Transport information

SECTION 14: Transport information

14.1 UN number
Not available.

14.2 UN proper shipping name

Not available.

14.3 Transport hazard class(es)
Not available.

14.4 Packing group
Not available.

14.5 Environmental hazards
Not available.

14.6 Special precautions for user
Not available.

14.7 Maritime transport in bulk according to IMO instruments
Not available.

SECTION 15: Regulatory information

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Not available.

15.2 Chemical safety assessment
Not available.

SECTION 16: Other information

SECTION 16: Other information

Product name: Avoparcin
Catalog No.: CS-ED-00974
CAS No.: 37332-99-3
Supplier: Clearsynth Labs Ltd., Mumbai, India
Emergency phone: +91-22-245045900

Revision date: Not available

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