

Revision date: 01/26/2015

Version No: 3

1. PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| Product Name | MICRO-ZYME PEX |
| Chemical Name | Enzyme preparation |
| Declared activity | Polygalacturonase |
| Use of the substance/preparation | biocatalysts used in a variety of industrial processes within food manufacturing |
| Contact Manufacturer | Anderson Chemical Company 325 South Davis Avenue Litchfield, MN 55355 www.accomn.com |
| Information Telephone Number | 1-320-693-2477, 8 am - 5:00 pm M-F |
| Emergency Telephone Number | 1-800-424-9300 (Chemtrec) 24 hours every day |

2. HAZARD(S) IDENTIFICATION

Classification Classification of the chemical in accordance with 29CFR §1910.1200

| | |
|---------------------------|------------|
| Respiratory sensitization | Category 1 |
|---------------------------|------------|


Label elements

Danger

Hazard Statements
 H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary Statements - Prevention
 P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
 P285 - In case of inadequate ventilation wear respiratory protection

Precautionary Statements - Response
 P304 + P341 - IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing
 P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician



Hazards not otherwise classified (HNOC)

| | |
|---|----------------------|
| 1 | Health |
| 1 | Flammability |
| 0 | Reactivity |
| X | Protective Equipment |



3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components

| Chemical Name | CAS-No | IUB No. | Weight %* |
|-------------------------|-----------|----------|-----------|
| Polygalacturonase (aep) | 9032-75-1 | 3.2.1.15 | 1 - 5 |

aep (active enzyme protein) contributes to the GHS classification.

* The exact percentage (concentration) of composition has been withheld as a trade secret

4. FIRST AID MEASURES

In case of unintended overexposure, the following measures apply

Inhalation

| | |
|------------------|--|
| Effects | May cause allergic respiratory reaction |
| Symptoms | Shortness of breath, wheezing and coughing The effect of inhalation may be delayed |
| First Aid | Remove person to fresh air. If signs/symptoms continue, get medical attention Show this safety data sheet to the doctor in attendance |

Skin Contact

| | |
|------------------|--|
| Effects | May cause slight irritation. |
| Symptoms | Slight irritation. |
| First Aid | Remove and wash contaminated clothing before re-use. Wash off immediately with plenty of water. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance. |

Eye Contact

| | |
|------------------|---|
| Effects | May cause slight irritation. |
| Symptoms | Slight irritation |
| First Aid | Hold eye open and rinse slowly and gently with water for 15-20 min. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance |

Ingestion

| | |
|------------------|--|
| Effects | Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. |
| Symptoms | Irritation |
| First Aid | Rinse mouth with water and drink plenty of water. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance. |

5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| Flammable Properties | Slightly flammable according to HMIS criteria |
| Suitable Extinguishing Media | Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide |
| Unsuitable Extinguishing Media | None |
| Hazardous Combustion Products | None |
| Specific Hazards Arising from the Chemical | May cause allergic respiratory reaction |

Protective Equipment and Precautions for Firefighters Self-contained breathing apparatus and standard turn-out apparel

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions For personal protection see section 8

Environmental Precautions Collect spillage.

Methods for cleaning up Avoid formation of dust and aerosols
Spilled preparation should be removed immediately to avoid formation of dust from dried preparation. Take up by mechanical means preferably by a vacuum cleaner equipped with a HEPA (High Efficiency Particulate Air) filter. Flush remainder carefully with plenty of water. Avoid splashing, high pressure washing or compressed air cleaning to avoid formation of aerosols. Ensure sufficient ventilation. Wash contaminated clothing.

For personal protection see section 8

7. HANDLING AND STORAGE

Handling Avoid formation of dust and aerosols
Ensure adequate ventilation
Liquid enzyme preparations are dustfree preparations. However, inappropriate handling may cause formation of dust or aerosols.

Storage Keep tightly closed in a dry and cool place. Temperature 0-10 °C (32-50 °F)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| Chemical Name | DNEL Dermal Acute Local (Workers) | DMEL Inhalation Long term Local (Workers) |
|-------------------------|-----------------------------------|---|
| Polygalacturonase (aep) | | DMEL = 60 ng/m ³ |

Derived Minimal Effect Level (DMEL)

Occupational exposure controls

Engineering Controls Ensure adequate ventilation, especially in confined areas
Maintain good conditions of industrial hygiene. Some processes may require enclosures, local exhaust ventilation, or other engineering controls to control airborne levels. Additional handling and healthy/safety information is available upon request

Personal Protective Equipment

Respiratory Protection In case of insufficient ventilation wear suitable respiratory equipment that meets HEPA/P100 specifications

Eye Protection Safety glasses with side-shields

Skin and body protection No special technical protective measures are necessary
General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practices
Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | |
|----------------|--|
| Physical State | Liquid |
| Color | Brown |
| Odor | Slight fermentation odor |
| Density (g/ml) | 1.17 |
| pH | Adjusted to the range where active enzyme is stable – typically pH 4 – 9 |
| Solubility | Active component is readily soluble in application-relevant solutions at all levels of concentration, temperature and pH which may occur in normal usage |

Other information No information available

10. STABILITY AND REACTIVITY

| | |
|---|---|
| Reactivity | Not relevant |
| Chemical stability | Stable under recommended storage conditions |
| Possibility of Hazardous Reactions | None under normal processing |
| Conditions to Avoid | None |
| Incompatible materials | None |
| Hazardous Decomposition Products | None |

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

| | |
|---------------------|--|
| Inhalation | Repeated inhalation of enzyme dust or aerosols resulting from improper handling may induce sensitization and may cause allergic type 1 reactions in sensitized individuals |
| Skin contact | Mild skin irritation |
| Eye contact | Mild eye irritation |
| Ingestion | |

| Chemical Name | Acute oral toxicity | Acute inhalation toxicity | Skin corrosion/irritation | Serious eye damage/eye irritation |
|-------------------------|--|---------------------------|------------------------------|-----------------------------------|
| Polygalacturonase (aep) | LD50: > 2000 mg/kg bw (OECD TG 401, 420) | | Not irritating (OECD TG 404) | Not irritating (OECD TG 405) |

| Chemical Name | Specific target organ toxicity – single exposure | Genetic toxicity | Skin sensitization | Respiratory sensitization |
|-------------------------|--|--|--------------------|-------------------------------|
| Polygalacturonase (aep) | | No indication of mutagenic effects (OECD TG 471, 476, 487) | | Sensitizer (Human experience) |

12. ECOLOGICAL INFORMATION

Toxicity

| Chemical Name | Daphnia, acute | Algae, acute | Fish, acute |
|-------------------------|--|---|--|
| Polygalacturonase (aep) | EC50 (48 hours): 31.7 - 457 mg aep/l (OECD TG 202) | ErC50 (72 hours): \geq 5.2 mg aep/l (OECD TG 201) | LC50 (96 hours): 58.3 - 326.7 mg aep/l (OECD TG 203) |

Persistence/Degradability

| Chemical Name | Persistence and degradability | Partition coefficient (n-octanol/water) | Bioaccumulative Potential |
|-------------------------|----------------------------------|---|---------------------------|
| Polygalacturonase (aep) | Readily biodegradable (OECD 301) | LogPow: <0 | Does not bioaccumulate |

Mobility in soil Not relevant

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of in accordance with local regulations

Contaminated Packaging Dispose of wastes in an approved waste disposal facility

14. TRANSPORT INFORMATION

Transport Regulations

No dangerous goods according to transport regulations
No special precautions required

Transport hazard class(es) not applicable

Packing group not applicable

Environmental hazards not applicable

15. REGULATORY INFORMATION

The product complies with the recommended purity specifications for food-grade enzymes given by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the Food Chemical Codex (FCC).

15. REGULATORY INFORMATION**USA, Federal Regulations**

TSCA Inventory The active ingredient and all components of the enzyme preparation are listed on the TSCA inventory

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and 40 CFR Part 372.

SARA 311/312 Hazardous Categorization

| | |
|-----------------------------------|----|
| Acute Health Hazard | No |
| Chronic Health Hazard | No |
| Fire Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Reactive Hazard | No |

USA, State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals

Canada

WHMIS Hazard Class Controlled product hazard class D2 A (respiratory sensitizer)

WHMIS Statement This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.

16. OTHER INFORMATION

GHS-Classification The GHS calculation method has been used for classification of this mixture.

Disclaimer The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text. Furthermore, as the conditions of use are beyond the control of Anderson Chemical Company, it is the responsibility of the customer to determine the conditions of safe use of these products.

End of Safety Data Sheet

Version No: 3 / ANSI / English / 01/26/2015