

**ACRYLAMIDE/SODIUM ACRYLATE COPOLYMER (CAS NO. 25085-02-3)**  
**ACRYLAMIDE, SODIUM ACRYLATE POLYMER (CAS NO. 25987-30-8)**  
**2-PROPENOIC ACID, POTASSIUM SALT, POLYMER WITH 2-PROPENAMIDE (CAS NO. 31212-13-2)**  
**SILICONE BASED EMULSION NEUTRALISED POLYACRYLIC BASED STABILIZER (NO CAS NO.)**

This group contains a sodium salt of a polymer consisting of acrylic acid, methacrylic acid or one of their simple esters and three similar polymers. They are expected to have similar environmental concerns and have consequently been assessed as a group. Information provided in this dossier is based on acrylamide/sodium acrylate copolymer (CAS No. 25085-02-3).

This dossier on acrylamide/sodium acrylate copolymer and similar polymers presents the most critical studies pertinent to the risk assessment of these polymers in their use in drilling muds. This dossier does not represent an exhaustive or critical review of all available data. Where possible, study quality was evaluated using the Klimisch scoring system (Klimisch et al., 1997).

Screening Assessment Conclusion – Acrylamide/sodium acrylate copolymer, acrylamide, sodium acrylate polymer and 2-propenoic acid, potassium salt, polymer with 2-propenamamide are polymers of low concern. Therefore, these polymers and the other similar polymer in this group are classified as **tier 1** chemicals and require a hazard assessment only.

## 1. BACKGROUND

Acrylamide/sodium acrylate copolymer is a sodium salt of a polymer consisting of acrylic acid, methacrylic acid or one of their simple esters. Acrylates are a family of polymers which are a type of vinyl polymer. Synthetic chemicals used in the manufacture of plastics, paint formulations and other products. Acrylate copolymer is a general term for copolymers of two or more monomers consisting of acrylic acid, methacrylic acid or one of their simple esters.

Based largely on its high molecular weight, acrylamide/sodium acrylate copolymer are not expected to bioaccumulate or bioconcentrate. It is of low toxicity to environmental receptors and is not expected to degrade substantially under environmental conditions.

## 2. CHEMICAL NAME AND IDENTIFICATION

**Chemical Name (IUPAC):** 2-Propenoic acid, sodium salt, polymer with 2-propenamamide

**CAS RN:** 25085-02-3

**Molecular formula:**  $(C_3H_5NO.C_3H_4O_2.NA)_x^-$

**Molecular weight:** No information is available. Based on the type and intended use of the copolymer, the molecular weight would likely range from 100,000 to >3,000,000 g/mol (Hamilton et al., 1997).

**Synonyms:** Acrylamide/sodium acrylate copolymer; 2-propenamamide, polymer with 2-propenoic acid, sodium salt; 2-propenoic acid, sodium salt, polymer with 2-propenamamide; 2-Propenamamide-sodium 2 propenoate copolymer; sodium acrylate acrylamide polymer; sodium acrylate-acrylamide copolymer

### 3. PHYSICO-CHEMICAL PROPERTIES

No information is available.

### 4. DOMESTIC AND INTERNATIONAL REGULATORY INFORMATION

A review of international and national environmental regulatory information was undertaken (Table 1). This chemical is listed on the Australian Inventory of Chemical Substances – AICS (Inventory). No conditions for its use were identified. No specific environmental regulatory controls or concerns were identified within Australia and internationally for acrylamide/sodium acrylate copolymer.

NICNAS has assessed acrylamide/sodium acrylate copolymer (CAS No. 25085-02-3), acrylamide, sodium acrylate polymer (CAS No. 25987-30-8) and 2-propenoic acid, potassium salt, polymer with 2-propenamido (CAS No. 31212-13-2) in an IMAP Tier 1 assessment and considers each a polymer of low concern<sup>1</sup>.

**Table 1 Existing International Controls**

Convention, Protocol or other international control	Listed Yes or No?
Montreal Protocol	No
Synthetic Greenhouse Gases (SGG)	No
Rotterdam Convention	No
Stockholm Convention	No
REACH (Substances of Very High Concern)	No
United States Endocrine Disrupter Screening Program	No
European Commission Endocrine Disruptors Strategy	No

### 5. ENVIRONMENTAL FATE SUMMARY

No studies are available. The acrylamide/sodium acrylate copolymer is not expected to be readily biodegradable. The physico-chemical properties of the copolymer would preclude it from undergoing significant biodegradation (Guiney *et al.*, 1997). Biodegradation is limited due to the very high molecular weight and the low water solubility of the copolymer. The copolymer will likely bind tightly to organic matter found within soils and sediments (Guiney *et al.*, 1997). The copolymer is not expected to bioaccumulate because of its poor water solubility and high molecular weight.

### 6. ENVIRONMENTAL EFFECTS SUMMARY

No studies are available. Acrylamide/sodium acrylate copolymer is expected to be a low concern for toxicity to aquatic organisms (Guiney *et al.*, 1997). Due to its poor solubility and high molecular weight, it is not expected to be bioavailable. It does not contain any reactive functional groups (*i.e.*, cationic groups).

<sup>1</sup> <https://www.nicnas.gov.au/chemical-information/imap-assessments/how-chemicals-are-assessed/Low-concern-polymers>.

## **7. CATEGORISATION AND OTHER CHARACTERISTICS OF CONCERN**

### **A. PBT Categorisation**

The methodology for the Persistent, Bioaccumulative and Toxic (PBT) substances assessment is based on the Australian and EU Reach Criteria methodology (DEWHA, 2009; ECHA, 2008).

Acrylamide/sodium acrylate copolymer is not readily biodegradable; thus it meets the screening criteria for persistence.

Acrylamide/sodium acrylate copolymer is expected to have a very high molecular weight and poor water solubility. It is not expected to be bioavailable. Thus this copolymer does not meet the criteria for bioaccumulation.

There are no aquatic toxicity studies on acrylamide/sodium acrylate copolymer. It is expected to have low concern for aquatic toxicity because of its very high molecular weight and poor water solubility. Thus the copolymer does not meet the criteria for toxicity.

The overall conclusion is that acrylamide/sodium acrylate copolymer is not a PBT substance.

### **B. Other Characteristics of Concern**

No other characteristics of concern were identified for acrylamide/sodium acrylate copolymer.

## 8. SCREENING ASSESSMENT

Chemical Name	CAS No.	Overall PBT Assessment <sup>1</sup>	Chemical Databases of Concern Assessment Step		Persistence Assessment Step		Bioaccumulative Assessment Step	Toxicity Assessment Step			Risk Assessment Actions Required <sup>3</sup>
			Listed as a COC on relevant databases?	Identified as Polymer of Low Concern	P criteria fulfilled?	Other P Concerns	B criteria fulfilled?	T criteria fulfilled?	Acute Toxicity <sup>2</sup>	Chronic Toxicity <sup>2</sup>	
Acrylamide/sodium acrylate copolymer	25085-02-3	Not a PBT	No	Yes	Yes	No	No	No	1	1	1
2-Propenoic acid, potassium salt, polymer with 2-propenamamide	31212-13-2	Not a PBT	No	Yes	Yes	No	No	No	1	1	1
Acrylamide, sodium acrylate polymer	25987-30-8	Not a PBT	No	Yes	Yes	No	No	No	1	1	1
Silicone based emulsion neutralised polyacrylic based stabiliser	NS	Not a PBT	No	No	Yes	No	No	No	1	1	1

**Footnotes:**

1 - PBT Assessment based on PBT Framework.

2 - Acute and chronic aquatic toxicity evaluated consistent with assessment criteria (see Framework).

3 - Tier 1 - Hazard Assessment only.

**Notes:**

NA = not applicable

PBT = Persistent, Bioaccumulative and Toxic

B = bioaccumulative

P = persistent

T = toxic

## 9. REFERENCES, ABBREVIATIONS AND ACRONYMS

### A. References

Department of the Environment, Water, Heritage and the Arts (DEWHA). (2009). Environmental risk assessment guidance manual for industrial chemicals, Department of the Environment, Water, Heritage and the Arts, Commonwealth of Australia.

European Chemicals Agency (ECHA). (2008). Guidance on Information Requirements and Chemical Safety Assessment, Chapter R11: PBT Assessment, European Chemicals Agency, Helsinki, Finland.

Guiney, P. D., McLaughlin, J. E., Hamilton, J. D., and Reinert, K. H. (1997). Dispersion Polymers. In: Ecological Assessment of Polymers Strategies for Product Stewardship and Regulatory Programs (Hamilton, J.D. and Sutcliffe, R. eds.), pp. 147-165, Van Nostrand Reinhold.

Hamilton, J. D., Vasconcellos, S. R., and Keener, R. L. (1997). Introduction. In: Ecological Assessment of Polymers Strategies for Product Stewardship and Regulatory Programs (Hamilton, J.D. and Sutcliffe, R. eds.), pp. 3-15, Van Nostrand Reinhold.

Klimisch, H. J., Andreae, M., and Tillmann, U. (1997). A systematic approach for evaluating the quality of experimental and toxicological and ecotoxicological data. Regul. Toxicol Pharmacol. 25:1-5.

### B. Abbreviations and Acronyms

AICS	Australian Inventory of Chemical Substances
COC	constituent of concern
DEWHA	Department of the Environment, Water, Heritage and the Arts
ECHA	European Chemicals Agency
EU	European Union
IUPAC	International Union of Pure and Applied Chemistry
KI	Klimisch scoring system
PBT	Persistent, Bioaccumulative and Toxic
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SGG	Synthetic Greenhouse Gases