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SAFETY DATA SHEET

GC Enhancer

Prepared under WHMIS (Hazardous Products Regulations, SOR/2015-17) / GHS Rev. 7.

DOCUMENT ID	VERSION	ISSUED	EFFECTIVE
HSS-PL-GCE-SDS	2.2	2026-10-21	2026-10-21

1 Identification

Product name	GC Enhancer (PCR additive for GC-rich and difficult templates)
Supplied in	Every HoppeSyler DNA polymerase and master mix kit (Taq, Hot Start Taq, ROBUST, High Fidelity, M4 Taq, and the 2X master mixes). Kit component; not sold separately.
Product type	Aqueous solution of betaine with dimethyl sulfoxide (DMSO); a PCR co-solvent additive.
Catalogue number	None of its own: a kit component, identified by the kit catalogue numbers above.
Recommended use	Laboratory reagent component of a polymerase chain reaction (PCR) kit. For laboratory research use only (RUO).
Restrictions on use	Not for food, drug, pesticide, or biological-product use. Not for human or animal diagnostic or therapeutic use.
Supplier	HoppeSyler Scientific Inc., 79 Bessemer Road, Unit 1, London, ON N6E 1P9, Canada
Origin	Developed and manufactured in Canada.
Emergency telephone	1-833-727-7522 · Email: info@hoppesyler.com

2 Hazard Identification

WHMIS / GHS classification	**Not classified.** The product does not meet the criteria for any physical, health, or environmental hazard class under the Hazardous Products Regulations (SOR/2015-17).
Basis for non-classification	Not classified on composition: no component reaches a health or environmental classification cut-off, and the flash point is estimated to be above 93 °C (calculated, not measured).
Signal word	None.
Pictograms	None.
Hazard statements	None.
Precautionary statements	None required by the classification. Handling and personal protection for laboratory use are given in Sections 7 and 8, including the glove guidance that DMSO calls for.
Other hazards	DMSO passes readily through intact skin and can carry dissolved substances through with it. This is not a classified hazard of the product, but it is the reason for the glove selection in Section 8 and the handling note in Section 7.

3 Composition / Information on Ingredients

Substance type: mixture (aqueous solution of betaine with a co-solvent).

Component	CAS-No	Concentration (w/w)
Betaine (trimethylglycine)	107-43-7	30-60%*
Water (nuclease-free)	7732-18-5	30-60%*
Dimethyl sulfoxide (DMSO)	67-68-5	10-30%*

* The actual concentration is withheld as a trade secret.

No component carries a carcinogen, germ-cell mutagen or reproductive-toxicant classification.

4 First-Aid Measures

Eye contact	Rinse cautiously with water for several minutes, holding the eyelids open. Remove contact lenses if present and easy to do, then continue rinsing. Get medical attention if irritation develops and persists.
Skin contact	Wash with plenty of soap and water. Remove contaminated clothing. Get medical attention if irritation develops and persists.

Inhalation	Not an expected route of exposure for this low-volatility aqueous liquid. Remove the person to fresh air if any discomfort occurs.
Ingestion	Rinse mouth with water. Do not induce vomiting. Get medical attention if a large amount is swallowed or if symptoms occur.
Symptoms / effects	None expected under normal handling. Transient mild eye or skin irritation may occur with direct or prolonged contact.
Note to physician	Treat symptomatically.

5 Fire-Fighting Measures

Suitable media	Water spray, water fog, dry chemical, carbon dioxide (CO_2), or alcohol-resistant foam. Use media appropriate to the surrounding fire.
Unsuitable media	None known.
Specific hazards	Not a flammable liquid (Section 9). The product as supplied does not readily support combustion; the dried residue, mainly betaine, is combustible. Hazardous combustion products may include carbon monoxide, carbon dioxide, and oxides of nitrogen and sulfur.
Firefighter PPE	Self-contained breathing apparatus (SCBA) and full protective gear for any surrounding fire.

6 Accidental Release Measures

Personal precautions	Wear the gloves given in Section 8 and eye protection. Avoid contact with eyes and skin. No special emergency measures are required for this small-volume, unclassified reagent.
Environmental	Avoid release to drains and waterways where practical; see Section 12. No special environmental precautions are required.
Containment / cleanup	Absorb the spill with paper towel or an inert absorbent. Wipe up, then clean the area with water. Place waste in a labelled container for disposal in accordance with Section 13.

7 Handling and Storage

Safe handling	Handle in accordance with good laboratory practice. Avoid contact with eyes. Wear the protective equipment given in Section 8 and wash hands after handling. DMSO is readily absorbed through intact skin and can carry dissolved substances with it, so avoid skin contact and replace a contaminated glove at once.
Safe storage	Store frozen at -20 °C with the rest of the kit and keep the container tightly closed. Thaw completely and mix before use.
Incompatibilities	Strong oxidising agents and strong acids, both of which react with DMSO.

8 Exposure Controls / Personal Protection

Exposure limits	Betaine has no occupational exposure limit. Dimethyl sulfoxide is not listed in the Ontario Table of Ontario Regulation 833 or in United States OSHA Table Z-1, and has no ACGIH threshold limit value; a German MAK value of 50 ppm (160 mg/m³) exists and is noted for reference. The product is an aqueous liquid dispensed in small volumes and does not generate a relevant vapour concentration in normal use; the vapour pressure of neat DMSO is 0.55 hPa at 20 °C. *Occupational exposure limits checked against the ACGIH threshold limit value list, United States OSHA 29 CFR 1910.1000 Table Z-1, and Ontario Regulation 833.*
Engineering controls	General laboratory ventilation is sufficient. No special engineering controls are required.
Eye / face protection	Safety glasses meeting CSA Z94.3.
Skin protection	Gloves and a laboratory coat. DMSO permeates common glove materials. For the small-volume pipetting this product is used for, nitrile gloves are acceptable against splash contact (nitrile at 0.2 mm has a breakthrough time of 38 minutes for neat DMSO), provided a contaminated glove is removed and replaced at once. For prolonged or immersive contact use a glove material rated for DMSO, such as butyl rubber.
Respiratory protection	Not required under normal handling of this low-volatility aqueous liquid.

9 Physical and Chemical Properties

Physical state	Liquid	**Decomposition temperature**	No data available
Colour	Colourless, clear	**pH**	Not measured; expected near neutral (betaine solutions are pH 5 to 7 at 5%, and DMSO is neutral)
Odour	No data available for the mixture (neat DMSO: odourless)	**Kinematic viscosity**	No data available
Melting point / freezing point	No data available (supplied frozen at -20 °C)	**Solubility**	Miscible with water
Boiling point / range	About 100 °C (aqueous solution; not measured)	**Partition coefficient (n-octanol/water, log K_{ow})**	No data available
Flammability	Not a flammable liquid (see flash point)	**Vapour pressure**	No data available for the mixture (neat DMSO: 0.55 hPa at 20 °C)
Explosion / flammability limits	No data available	**Density / relative density**	No data available
Flash point	**None expected below 93 °C (calculated, not measured).**	**Relative vapour density**	No data available
Auto-ignition temperature	No data available (neat DMSO: 300 to 302 °C)	**Particle characteristics**	Not applicable (liquid)

10 Stability and Reactivity

Reactivity / stability Stable under the recommended storage and handling conditions. No hazardous polymerisation. No hazardous reactions known.

Conditions to avoid Repeated freeze/thaw cycles and prolonged storage above -20 °C, which may reduce performance and are not a safety hazard. Keep away from strong oxidisers and strong acids.

Incompatible materials Strong oxidising agents and strong acids.

Decomposition products Thermal decomposition may yield carbon monoxide, carbon dioxide, and oxides of nitrogen and sulfur, from the betaine and the DMSO.

11 Toxicological Information

Likely routes of exposure Skin and eye contact during pipetting are the only realistic routes. Ingestion is unlikely, and inhalation is not an expected route for this low-volatility aqueous liquid. DMSO penetrates intact skin readily (Section 7).

Acute toxicity Not classified. No toxicity data exist for the mixture itself; the assessment is by calculation from the components, both of which are practically non-toxic, and the mixture is not acutely toxic by the oral, dermal or inhalation route.

Skin corrosion / irritation Not classified. Transient mild irritation may occur with prolonged direct contact.

Serious eye damage / irritation Not classified. Neither betaine nor dimethyl sulfoxide is classified for eye effects; dimethyl sulfoxide causes slight, reversible irritation in the standard rabbit test (OECD 405). Transient mild irritation may occur with direct contact.

Respiratory / skin sensitisation Not classified. Neither betaine nor DMSO is classified as a respiratory or skin sensitiser.

Specific target organ toxicity (single and repeated exposure) Not classified.

Aspiration hazard Not classified.

Carcinogenicity, mutagenicity, reproductive toxicity Not classified. Neither betaine nor dimethyl sulfoxide carries a carcinogen, germ-cell mutagen or reproductive-toxicant classification, and neither appears in the ACGIH threshold limit value list, so neither carries an ACGIH carcinogen notation.

Component data Neither betaine nor dimethyl sulfoxide is classified for any health hazard. Reference values:

- Dimethyl sulfoxide: oral LD50 28,300 mg/kg (rat); dermal LD50 40,000 mg/kg (rat); inhalation LC0 above 5.33 mg/L (rat, 4 h). Practically non-toxic. It penetrates skin readily and can carry dissolved substances with it (Section 7).
- Betaine: not classified for any health, physical or environmental hazard.

12 Ecological Information

Ecotoxicity Not classified as hazardous to the aquatic environment. No component carries an aquatic classification. Reference values for DMSO: fish LC50 above 25,000 mg/L, daphnia EC50 24,600 mg/L, algae EC50 17,000 mg/L.

Persistence and degradability DMSO is not readily biodegradable (31% in 28 days). No degradation data are available for betaine.

Bioaccumulative potential Low for both components, which are highly water-soluble.

Mobility in soil Highly mobile in soil and water, being miscible with water.

Other adverse effects	None known.

13 Disposal Considerations

Dispose of contents and container in accordance with local, provincial and federal regulations. The product is not classified as a hazardous waste on the basis of its composition; users must still verify their own waste characterisation and any institutional requirements. Do not release large volumes to drains.

14 Transport Information

TDG (Canada)	**Not regulated** under the Transportation of Dangerous Goods Regulations (SOR/2001-286). No UN number or packing group applies.

15 Regulatory Information

Canada (WHMIS)	Not classified under the Hazardous Products Regulations (SOR/2015-17). All three components (betaine, water and dimethyl sulfoxide) are listed on the Canadian Domestic Substances List (DSL).
Other jurisdictions	United States (TSCA): contact HoppeSyler Scientific for inventory compliance status. No component is listed under California Proposition 65.

16 Other Information

Prepared by	HoppeSyler Scientific Inc. · Approved by: HoppeSyler Scientific Inc.
Version	2.2
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Legend	GHS = Globally Harmonized System of Classification and Labelling of Chemicals; WHMIS = Workplace Hazardous Materials Information System; HPR = Hazardous Products Regulations; TDG = Transportation of Dangerous Goods; DSL = Domestic Substances List; TSCA = Toxic Substances Control Act; RUO = Research Use Only; PCR = polymerase chain reaction; DMSO = dimethyl sulfoxide; ACGIH = American Conference of Governmental Industrial Hygienists; MAK = Maximale Arbeitsplatzkonzentration (German occupational limit); LD50 = median lethal dose; LC50 = median lethal concentration; EC50 = median effective concentration; H = hazard statement; P = precautionary statement.

Disclaimer. The information herein is provided in good faith and believed accurate as of the effective date. It is the user's responsibility to determine suitability for their purpose. HoppeSyler Scientific Inc. makes no warranty and assumes no liability for use of this information.

END OF SAFETY DATA SHEET