



**GEOLIQUIDS, INC.**

## Chemical Based Products

### GEOLIQUIDS

## MI-GEE Brand Methylene Iodide

MI-GEE is a pure form of Methylene Iodide and is widely used for testing and separating minerals and for testing high index glasses, minerals and gems. It is also used in a variety of organic chemical syntheses. One of these is the Simmons & Smith Synthesis (JACS 80, 5323, 1958) for putting a methylene group into an organic molecule.

#### Properties:

MI-GEE Assays 99.9% Minimum  $\text{CH}_2\text{I}_2$

Formula Weight: 267:87

Synonym: Diiodomethane

Iodine Content, Theory: 94.76%

Density:  $d_4^{20} = 3.325$  (Very close to Specific Gravity)

Refractive Index:  $n_D^{15} = 1.74$

Melting Point: 5-6°C (41 - 42.8°F)

Boiling Point: 181°C (358°F)

Flash Point: None

Viscosity:  $\text{Cp @ } 25^\circ\text{C.} = 0.02$  (Acetone=0.32)

Vapor Pressures:

Degrees C.-	20.6	29.5	39	56	68	88	101	106.5	152	181
mm Mercury-	1.01	1.9	3.5	5	11	39	60	70	330	760

Most of the uses of MI-GEE are for its high density of 3.325 and its high refractive index of 1.74. This usefulness lies in the fact that it is a liquid at room temperatures, has a low viscosity and a very good wetting power on powders, gems and minerals in spite of its high density. It may also be looked upon as a solvent. MI-GEE has a light straw to clear color. However, it darkens on exposure to light, air and

moisture. Use in or exposure to strong sunlight or strong mercury vapor lights should be avoided. Any darkening is due to liberation of a small amount of free iodine. This is easily removed by shaking with a cool 5 - 10% solution of Sodium Hydroxide or Sodium Carbonate, washing twice with plain water, separating and filtering. Due to the highly labile nature of Methylene Iodide, Gas Chromatography can not be used to analyze it, as heat decomposes the material to give low results. MI-GEE is shipped with Copper wire screen preservative added. Copper wire sinks to the bottom, causes no difficulty in use, does not contaminate MI-GEE, and will keep it light in color for several years. MI-GEE should always be stored in total darkness and in closed containers when not in use. Mercury should never be used to lighten the color or preserve Methylene Iodide as it produces toxic compounds.

MI-GEE is miscible with acetone, methanol, ethanol, methylene chloride, ether, chloroform, dimethyl sulfoxide and other solvents. Some of these solvents may be used to remove and recover MI-GEE for reuse and some of them may be used advantageously to adjust its density to lower values if required.

Dimethyl Sulfoxide (Cuttitta, Meyrowitz, & Levin, Am. Mineral, 45, 726, 1960) gives solutions of lower density that change density very little with use but darken on standing but with a useful life of about a month. For recovery of MI-GEE, it is washed out of the lumps or powders being tested with acetone or alcohol (away from flame) and poured into several times its volume of plain water and shaken well. This is repeated a second time and the bottom layer of MI-GEE is separated in a funnel and filtered for reuse. This procedure eliminates actual distillation of MI-GEE resulting in higher recovery of useable material. MI-GEE is not flam-

mable but vapors generated during distillation or boiling will burn and give off large quantities of iodine vapor.

Yellow Phosphorus, Sulfur and MI-GEE mixed in the proportion of 8:1:1 by weight (West Am. Mineral, 21, 245, 1936) gives a liquid of refractive index 2.06 which is one of the highest obtainable with a useful liquid. To obtain liquids between 1.74 and 2.06, the above liquid may be diluted with MI-GEE. These liquids containing yellow Phosphorus must be stored under water and handled with all caution pertaining to yellow Phosphorus, as they will ignite spontaneously in air, and are toxic.

We have traced conflicting reports on the toxicity of Methylene Iodide to certain materials added during or after manufacture and these are not present in MI-GEE. This permits it to exhibit only its natural toxicity, which is lower than had been previously thought. By comparison with methylene chloride, it is estimated that the threshold limit for constant 8 hour exposure to MIGEE vapors is 25 ppm. The figure for methylene chloride is 500 ppm, chloroform 50 ppm, and carbon tetrachloride 10 ppm (values for last three are from federal standards by NIOSH or OSHA). Due to its high boiling point, and therefore low vapor pressure, the 25 ppm value is not reached easily as compared with more volatile solvents, and the fumes are easily detected by their odor and readily dispersed with moderate ventilation. As with any solvent, MI-GEE should be used with adequate ventilation.

In case MI-GEE is spilled on the skin in quantity, it should be wiped off thoroughly and then wiped off with acetone or alcohol (away from flame), and finally washed well with soap and water. All of this solvency will degrease the skin quite a bit. The loss of natural oils should be replaced with lanolin or "Vaseline." Lanolin or "Vaseline" may be applied to the hands before working with quantities of MI-GEE as a precautionary measure to protect them. This, in some cases, may avoid the use of rubber gloves.

**Shipping Information:** Chemicals NOIBN

Containers:

- 1 lb. 1/2 pint bottle
- 5 lb. 1 quart plastic bottle (approx. 2/3 full)
- 25 lb. 1 gallon metal can or 5.5 lb. bottles
- 100 lb. 1-5 gallon steel drum or 4 x 25 lbs. or 20 x 5 lb. plastic bottles - Please state preference.

MI-GEE is available for prompt shipment from stock on quantities up to 100 pounds. Inquiry is invited on larger quantities.

The information in this bulletin is, to the best of our knowledge, accurate and correct but is supplied only to facilitate handling MI-GEE as safely as possible, and no warranty, expressed or implied, is given as to its accuracy.



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