

Unsymmetrical Dimethylhydrazine (UDMH)

Unsymmetrical dimethylhydrazine (1,1-dimethylhydrazine) is a clear, colorless hygroscopic liquid. It has an ammonia-like odor which closely resembles that of aliphatic amines. UDMH is miscible with water, hydrazine, dimethylenetriamine, ethanol, amines and most petroleum fuels.

UDMH is mildly alkaline and is a very strong reducing agent. Its high chemical reactivity, easily-controlled functionality and strong hydrogen bonding are its most useful properties.

Table 1 Specifications

Component	% by Weight
1,1-dimethylhydrazine, min	98.0
Amines and water, max	2.0

Table 2 Typical Physical Properties

Density @ 25°C	(g/ml)	0.784
	(lb/gal)	6.6
Viscosity @ 20°C (cp)		0.56
Boiling Point	(°C)	63
	(°F)	146
Freezing Point	(°C)	-57.2
	(°F)	-71
Flash Point, COC	(°C)	-15
	(°F)	5
Flammable Limits in Air (% by vol)		2-95

Handling, Storage and Safety

The experience accumulated by the chemical and aerospace industries indicates that with rigid adherence to proper precautions, UDMH can be handled safely. Because UDMH vapors have such a very wide range of explosive limits and because UDMH liquid is extremely reactive with many materials, the safety precautions outlined are necessary to avoid fire or explosions.

Applications

The major application of UDMH is in the aerospace industry, where it is used primarily as a propellant. It is also used in chemical synthesis, where an N-N bond and two methyl groups are needed (e.g. in the synthesis of photographic

chemicals). It has also been used in acidic gas absorbers and as a fuel additive stabilizer.

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In addition, prolonged exposure to UDMH vapor, contact with skin, or ingestion may produce harmful or fatal effects.

Storage: UDMH may be stored in the DOT-approved container in which it is shipped. (See *Shipping Information* below.) Store away from heat, sparks, open flame and oxidants. Store only in well-ventilated areas. Do not contaminate.

Since UDMH is stable, it can be stored without loss of purity. Keep the container closed securely. Drums should be vented carefully when opening.

If you wish information on bulk storage, Arch Chemicals Technical Service is available to assist you. Contact the Arch Chemicals Sales Office.

Safety Precautions: UDMH is insensitive to shock or friction. But, both UDMH and its vapor can be flammable or explosive in the presence of heat, flame, sparks, contaminants and oxidizers, including air.

All containers and handling equipment for UDMH should be electrically grounded. And because of the rapid rate of oxidation, which may lead to fire or explosion, an inert atmosphere is necessary over UDMH at all times.

Nitrogen, which is inert and readily available, has been adopted as the padding material for UDMH storage and transfer. The lower explosive limit for UDMH vapor in air is 2.0%. This value increases significantly when a nitrogen atmosphere is used.

Avoid contact between UDMH and strong oxidizers such as



Product Information

hydrogen peroxide, nitrogen tetroxide, fluorine, halogens and fuming nitric acid. Such contact will result in immediate ignition or explosion.

Avoid contact with metal oxides such as those of iron, copper, lead, manganese and molybdenum. Contact with such metallic oxide surfaces may lead to flaming decomposition. Avoid contact with organic materials having large surface areas, or porous surfaces. Absorption of UDMH by rags, cotton waste, sawdust or similar organic materials will eventually result in spontaneous ignition.

For additional details on handling and use of UDMH, contact

Or visit our web site www.hydrazone.com

Performance Chemicals Hydrazine

the Arch Chemicals Sales Office listed at the end of the document.

Shipping Information

UDMH is available in 55-gallon (335 lbs net) nonreturnable drums. These drums meet DOT Specification 1A1/X containing 304 stainless steel less than 0.05% molybdenum. UDMH can be supplied in customer provided pressure cylinders.

Please refer to the Material Safety Data Sheet (MSDS) for complete information on Storage and Handling, Toxicological Properties, Personal Protection, First Aid, Spill and Leak Procedures, and Waste Disposal. To order an MSDS, call the Arch Chemicals sales office listed below or MSDS Control at (800) 511-MSDS. Before using or handling this product, the MSDS should be thoroughly reviewed.

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