

N-PENTANE

PTA

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid	Colorless	Gasoline odor
	Floats on water. Flammable vapor is produced. Boiling point is 97°F.		
	Evacuate. Keep people away. Shut off ignition sources and call fire department. Stay upwind and use water spray to "knock down" vapor. Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.		
Fire	FLAMMABLE. Flashback along vapor trail may occur. Containers may explode when heated. Vapor may explode if ignited in an enclosed area. Extinguish with foam, dry chemical or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.		
Exposure	CALL FOR MEDICAL AID. VAPOR If inhaled, will cause dizziness or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Harmful if swallowed. IF SWALLOWED and victim is CONSCIOUS, have victim drinkwater or milk. DO NOT INDUCE VOMITING.		
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.		

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
Contain
Collection Systems: Skim
Chemical and Physical Treatment: Burn
Salvage waterfowl

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 31; Paraffin
2.2 Formula: n-C₅H₁₂
2.3 IMO/UN Designation: 3.1/1265
2.4 DOT ID No.: 1265
2.5 CAS Registry No.: 109-66-0
2.6 NAERG Guide No.: 128
2.7 Standard Industrial Trade Classification: 51114

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Goggles or face shield (as for gasoline).
3.2 Symptoms Following Exposure: Low toxicity. Very high vapor concentrations produce narcosis. Aspiration into lungs can produce chemical pneumonitis and/or pulmonary edema.
3.3 Treatment of Exposure: INHALATION: remove from exposure; support respiration if needed. INGESTION: do NOT induce vomiting; call physician.
3.4 TLV-TWA: 600 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Currently not available
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: None
3.10 Vapor (Gas) Irritant Characteristics: Vapors are nonirritating to the eyes and throat.
3.11 Liquid or Solid Characteristics: No appreciable hazard. Practically harmless to the skin.
3.12 Odor Threshold: 10 ppm
3.13 IDLH Value: 1,500 ppm
3.14 OSHA PEL-TWA: 1,000 ppm
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: -57°F C.C.
4.2 Flammable Limits in Air: 1.4-8.3% (by vol.)
4.3 Fire Extinguishing Agents: Foam, dry chemical, carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Containers may explode
4.7 Auto Ignition Temperature: 500°F
4.8 Electrical Hazards: Class I, Group D
4.9 Burning Rate: 8.6 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichiometric Air to Fuel Ratio: 38.1 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 11.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): N₂ diluent: 12.0%; CO₂ diluent: 14.5%

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: No reaction
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: >80 ppm*/toxic/lethal/fresh water
*Time period not specified
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 3
Human Oral hazard: 0
Human Contact hazard: 0
Reduction of amenities: 0

7. SHIPPING INFORMATION

7.1 Grades of Purity: Pure (99.2%); technical; research (99.98%)
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Open (flame arrester) or pressure-vacuum
7.5 IMO Pollution Category: (C)
7.6 Ship Type: 3
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Flammable liquid
8.2 49 CFR Class: 3
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	1
Flammability (Red).....	4
Instability (Yellow).....	0

8.6 EPA Reportable Quantity: Not listed.
8.7 EPA Pollution Category: Not listed.
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 72.15
9.3 Boiling Point at 1 atm: 97.0°F = 36.1°C = 309.3°K
9.4 Freezing Point: -201.0°F = 129.4°C = 143.8°K
9.5 Critical Temperature: 385.7°F = 196.5°C = 469.7°K
9.6 Critical Pressure: 490 psia = 33.3 atm = 3.37 MN/m²
9.7 Specific Gravity: 0.626 at 20°C (liquid)
9.8 Liquid Surface Tension: 16 dynes/cm = 0.016 N/m at 20°C
9.9 Liquid Water Interfacial Tension: 50.2 dynes/cm = 0.0502 N/m at 20°C
9.10 Vapor (Gas) Specific Gravity: 2.5
9.11 Ratio of Specific Heats of Vapor (Gas): 1.075
9.12 Latent Heat of Vaporization: 153.7 Btu/lb = 85.38 cal/g = 3.575 X 10⁵ J/kg
9.13 Heat of Combustion: -19,352 Btu/lb = -10,751 cal/g = -450.12 X 10⁵ J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: 27.89 cal/g
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 15.5 psia

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
-20	41.980	15	0.526	0	0.870	-20	0.377
-15	41.810	20	0.529	10	0.860	-15	0.365
-10	41.650	25	0.532	20	0.850	-10	0.354
-5	41.480	30	0.535	30	0.840	-5	0.344
0	41.320	35	0.538	40	0.831	0	0.333
5	41.150	40	0.541	50	0.821	5	0.324
10	40.990	45	0.544	60	0.811	10	0.315
15	40.820	50	0.547	70	0.801	15	0.306
20	40.660	55	0.549	80	0.791	20	0.298
25	40.490	60	0.552	90	0.781	25	0.290
30	40.330	65	0.555			30	0.283
35	40.160	70	0.558			35	0.275
40	40.000	75	0.561			40	0.269
45	39.830	80	0.564			45	0.262
50	39.670	85	0.567			50	0.256
55	39.510	90	0.570			55	0.250
60	39.340	95	0.573			60	0.244
65	39.180					65	0.239
70	39.010					70	0.233
75	38.850					75	0.228

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	I	35	3.822	35	0.05193	0	0.351
	N	40	4.323	40	0.05815	25	0.366
	S	45	4.876	45	0.06494	50	0.382
	O	50	5.485	50	0.07233	75	0.397
	L	55	6.153	55	0.08036	100	0.412
	U	60	6.885	60	0.08905	125	0.427
	B	65	7.685	65	0.09845	150	0.442
	L	70	8.557	70	0.10860	175	0.457
	E	75	9.505	75	0.11950	200	0.471
		80	10.540	80	0.13120	225	0.486
		85	11.650	85	0.14380	250	0.500
		90	12.860	90	0.15720	275	0.514
		95	14.160	95	0.17160	300	0.528
		100	15.570	100	0.18690	325	0.541
		105	17.080	105	0.20330	350	0.555
		110	18.700	110	0.22060	375	0.568
		115	20.440	115	0.23900	400	0.582
		120	22.300	120	0.25860	425	0.595
						450	0.608
						475	0.620
						500	0.633
						525	0.645
						550	0.658
						575	0.670
						600	0.682