

Nitrous oxide

Other names:	DINITROGEN MONOXIDE Dinitrogen oxide Factitious air Hyponitrous acid anhydride LAUGHING GAS N2O Nitral Nitrogen monoxide Nitrogen oxide Nitrogen oxide (N2O) UN 1070 UN 2201
Inchi:	InChI=1S/N2O/c1-2-3
InchiKey:	GQPLMRYTRLFLPF-UHFFFAOYSA-N
Formula:	N2O
SMILES:	[N-]=[N+]=O
Mol. weight [g/mol]:	44.01
CAS:	10024-97-2

Physical Properties

Property code	Value	Unit	Source
af	0.1650		KDB
affp	549.80	kJ/mol	NIST Webbook
affp	575.20	kJ/mol	NIST Webbook
basg	523.30	kJ/mol	NIST Webbook
basg	548.70	kJ/mol	NIST Webbook
dm	0.20	debye	KDB
ea	0.22 ± 0.10	eV	NIST Webbook
ea	0.76 ± 0.10	eV	NIST Webbook
ea	0.27 ± 0.17	eV	NIST Webbook
ea	-0.15 ± 0.10	eV	NIST Webbook
gf	103.70	kJ/mol	KDB
hf	81.60	kJ/mol	KDB
ie	12.89 ± 0.01	eV	NIST Webbook
ie	12.89 ± 0.00	eV	NIST Webbook
ie	12.91 ± 0.03	eV	NIST Webbook
ie	12.90	eV	NIST Webbook

ie	12.00 ± 1.00	eV	NIST Webbook
ie	12.89 ± 0.01	eV	NIST Webbook
ie	12.89	eV	NIST Webbook
ie	12.89 ± 0.01	eV	NIST Webbook
ie	12.80 ± 0.05	eV	NIST Webbook
ie	12.89	eV	NIST Webbook
ie	12.89	eV	NIST Webbook
ie	12.89	eV	NIST Webbook
ie	12.89 ± 0.00	eV	NIST Webbook
ie	12.89 ± 0.01	eV	NIST Webbook
ie	12.88 ± 0.01	eV	NIST Webbook
ie	12.88 ± 0.01	eV	NIST Webbook
log10ws	1.67		Crippen Method
logp	-0.158		Crippen Method
mcvol	28.090	ml/mol	McGowan Method
pc	7270.00 ± 50.00	kPa	NIST Webbook
pc	7238.00 ± 20.00	kPa	NIST Webbook
pc	7255.00	kPa	KDB
pc	7234.60 ± 50.66	kPa	NIST Webbook
pt	87.91 ± 0.01	kPa	NIST Webbook
pt	87.89 ± 0.01	kPa	NIST Webbook
pt	87.85	kPa	KDB
rhoc	453.33 ± 2.20	kg/m3	NIST Webbook
rhoc	448.93	kg/m3	NIST Webbook
rhoc	453.33 ± 4.40	kg/m3	NIST Webbook
rinpol	182.00		NIST Webbook
rinpol	182.00		NIST Webbook
tb	184.67	K	KDB
tc	309.57	K	KDB
tc	309.55 ± 0.50	K	NIST Webbook
tc	309.65 ± 0.20	K	NIST Webbook
tc	309.49	K	NIST Webbook
tc	309.56 ± 0.15	K	NIST Webbook
tf	182.30	K	KDB
tt	181.99	K	Solid Liquid Equilibria for the CO2 + R23 and N2O + R23 Systems
tt	182.32	K	KDB
vc	0.096 ± 0.002	m3/kmol	NIST Webbook
vc	0.097	m3/kmol	KDB
zc	0.2734100		KDB
zra	0.28		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
hfust	6.50	kJ/mol	182.40	NIST Webbook
hsubt	23.60	kJ/mol	113.00	NIST Webbook
hsubt	24.60	kJ/mol	165.00	NIST Webbook
hsubt	25.10 ± 0.40	kJ/mol	74.00	NIST Webbook
hvapt	16.10	kJ/mol	209.00	NIST Webbook
hvapt	16.50	kJ/mol	184.70	NIST Webbook
pvap	760.60	kPa	227.36	PVT Properties of Dinitrogen Monoxide
pvap	912.10	kPa	232.37	PVT Properties of Dinitrogen Monoxide
pvap	915.40	kPa	232.43	PVT Properties of Dinitrogen Monoxide
pvap	1092.90	kPa	237.49	PVT Properties of Dinitrogen Monoxide
pvap	1294.70	kPa	242.57	PVT Properties of Dinitrogen Monoxide
pvap	1521.90	kPa	247.65	PVT Properties of Dinitrogen Monoxide
pvap	759.60	kPa	227.32	PVT Properties of Dinitrogen Monoxide
pvap	2061.80	kPa	257.80	PVT Properties of Dinitrogen Monoxide
pvap	2065.40	kPa	257.87	PVT Properties of Dinitrogen Monoxide
pvap	2379.00	kPa	262.90	PVT Properties of Dinitrogen Monoxide
pvap	2381.80	kPa	262.95	PVT Properties of Dinitrogen Monoxide
pvap	2730.60	kPa	267.98	PVT Properties of Dinitrogen Monoxide
pvap	2734.00	kPa	268.03	PVT Properties of Dinitrogen Monoxide
pvap	3119.90	kPa	273.08	PVT Properties of Dinitrogen Monoxide

Density, Viscosity, and N₂O Solubility of Aqueous Solutions of MEA, BTH, and PIP: Measurements for N₂O + CH₂F₂, N₂O + CH₂F₂ + CH₂F₂, and N₂O + CH₂F₂ binary Systems: Measurements and Virial Coefficients for the R32+N₂O System: Diffusion Coefficients of N₂O in Aqueous Piperazine Solutions Using the Taylor Dispersion Technique from (293 to 333) K and (0.3 to 1.4) mol/L. Solubility of carbon dioxide, nitrous oxide, ethane, and nitrogen in Physical Solubility and Diffusivity of N₂O and CO₂ in Aqueous Solutions of 1,3-bis(hydroxymethyl)imidazolidin-2-one and 1,3-bis(hydroxymethyl)imidazolidin-2-one + 1,3-bis(hydroxymethyl)imidazolidin-2-one system: (N-Methyl diethanolamine + {xCH₃Cl + (1-x)H₂O} at temperatures (159.01 and 182.00) K. of Nitrous Oxide in Aqueous Methyl diethanolamine Solutions: Phase Behavior of N₂O and CO₂ in Room-Temperature Ionic Liquids Solubility of N₂O in the CO₂ + R23 and N₂O + R23 Systems: Solubility of N₂O in the CO₂ + R125 and N₂O + R125 Systems: A New Crippen Method:

<https://www.doi.org/10.1021/acs.jced.8b00070>
<https://www.doi.org/10.1016/j.fluid.2004.11.021>
<https://www.doi.org/10.1007/s10765-006-0033-6>
<https://www.doi.org/10.1021/je700717w>
<https://www.cheric.org/files/research/kdb/mol/mol1931.mol>
<https://www.doi.org/10.1016/j.jct.2012.11.010>
<https://www.doi.org/10.1021/je0301951>
<https://www.doi.org/10.1021/je0503148>
<https://www.doi.org/10.1016/j.jct.2004.05.009>
<https://www.doi.org/10.1021/acs.jced.7b00112>
<https://www.doi.org/10.1007/s10765-011-1150-4>
<https://www.doi.org/10.1007/s10765-008-0511-0>
<https://www.doi.org/10.1021/je0603067>
https://www.chemeo.com/doc/models/crippen_log10ws
<https://www.doi.org/10.1021/je300102d>
<https://www.doi.org/10.1021/je700384e>
<https://www.doi.org/10.1016/j.jct.2019.05.017>
<https://www.doi.org/10.1021/je049633+>
<https://www.doi.org/10.1016/j.jct.2018.06.021>
<https://www.doi.org/10.1016/j.fluid.2008.04.003>
<https://www.doi.org/10.1021/je060140+>
<https://www.doi.org/10.1007/s10765-006-0082-x>
<http://pubs.acs.org/doi/abs/10.1021/ci990307i>
<http://link.springer.com/article/10.1007/BF02311772>
<http://webbook.nist.gov/cgi/cbook.cgi?ID=C10024972&Units=SI>
<https://www.doi.org/10.1016/j.jct.2006.04.010>
<https://www.doi.org/10.1016/j.jct.2007.05.013>
<https://www.doi.org/10.1016/j.fluid.2014.03.015>

Solubility of N₂O in and Density and Viscosity of Aqueous Solutions of Piperazine, N-methyl diethanolamine, and N-methyl diethanolamine + N-methyl diethanolamine for the CO₂ + R125 and N₂O + R125 Systems: Solubility of N₂O and CO₂ in non-aqueous systems of methanol, 1,3-bis(hydroxymethyl)imidazolidin-2-one, and 1,3-bis(hydroxymethyl)imidazolidin-2-one + 1,3-bis(hydroxymethyl)imidazolidin-2-one system: Measurements and correlations of solubility of N₂O in and density, viscosity of carbon dioxide in aqueous solutions of amino acid salts: Solubility of N₂O in the CO₂ + R125 Binary System: Virial Coefficients from Burnett Measurements for the R23 + N₂O System Method:

McGowan Method:

NIST Webbook:

Vapour pressure and excess Gibbs free energy of the ternary system {x1CH₃F + x2N₂O + x3N₂O} at temperature of measurements: Solubility of carbon dioxide, nitrous oxide and methane in ionic liquids at pressures close to atmospheric:

Legend

af:	Acentric Factor
affp:	Proton affinity
basg:	Gas basicity
dm:	Dipole Moment
ea:	Electron affinity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
hfust:	Enthalpy of fusion at a given temperature
hsubt:	Enthalpy of sublimation at a given temperature
hvapt:	Enthalpy of vaporization at a given temperature

ie:	Ionization energy
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pt:	Triple Point Pressure
pvap:	Vapor pressure
rhoc:	Critical density
rhof:	Liquid Density
rinpol:	Non-polar retention indices
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume
zc:	Critical Compressibility
zra:	Rackett Parameter

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