

sulfur

Other names:	Insoluble sulfur Sulfur atom Sulphur
Inchi:	InChI=1S/S
InchiKey:	NINIDFKCEFEMDL-UHFFFAOYSA-N
Formula:	S
SMILES:	[S]
Mol. weight [g/mol]:	32.06
CAS:	7704-34-9

Physical Properties

Property code	Value	Unit	Source
af	0.1710		KDB
affp	664.30	kJ/mol	NIST Webbook
basg	640.20	kJ/mol	NIST Webbook
ea	2.07 ± 0.13	eV	NIST Webbook
ea	2.08 ± 0.00	eV	NIST Webbook
ea	2.02 ± 0.00	eV	NIST Webbook
ea	2.08 ± 0.00	eV	NIST Webbook
gf	238.60	kJ/mol	KDB
hf	279.20	kJ/mol	KDB
hf	277.17 ± 0.15	kJ/mol	NIST Webbook
ie	10.50 ± 0.30	eV	NIST Webbook
ie	10.50 ± 0.30	eV	NIST Webbook
ie	10.30 ± 0.30	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
ie	10.50 ± 0.30	eV	NIST Webbook
ie	10.50	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
ie	11.00 ± 0.50	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
ie	10.40 ± 0.30	eV	NIST Webbook
ie	10.40 ± 0.30	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
ie	10.36	eV	NIST Webbook
pc	18208.10 ± 18.18	kPa	NIST Webbook

pc	20700.00	kPa	KDB
rhoc	564.34 ± 5.61	kg/m3	NIST Webbook
sgb	167.83 ± 0.01	J/mol×K	NIST Webbook
ss	32.05 ± 0.05	J/mol×K	NIST Webbook
tb	717.75	K	KDB
tc	1313.00 ± 1.31	K	NIST Webbook
tc	1314.00	K	KDB
tf	388.36	K	KDB
tt	388.33	K	KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
rhoI	1848.86	kg/m3	334.30	Density of molten sulfur in the 334 508K range
rhoI	1848.17	kg/m3	335.30	Density of molten sulfur in the 334 508K range
rhoI	1847.82	kg/m3	336.30	Density of molten sulfur in the 334 508K range
rhoI	1846.09	kg/m3	337.30	Density of molten sulfur in the 334 508K range
rhoI	1844.88	kg/m3	338.30	Density of molten sulfur in the 334 508K range
rhoI	1844.36	kg/m3	339.40	Density of molten sulfur in the 334 508K range
rhoI	1842.46	kg/m3	340.40	Density of molten sulfur in the 334 508K range
rhoI	1841.94	kg/m3	341.40	Density of molten sulfur in the 334 508K range
rhoI	1841.42	kg/m3	342.50	Density of molten sulfur in the 334 508K range
rhoI	1839.87	kg/m3	343.50	Density of molten sulfur in the 334 508K range
rhoI	1839.87	kg/m3	344.50	Density of molten sulfur in the 334 508K range
rhoI	1838.15	kg/m3	346.60	Density of molten sulfur in the 334 508K range

rhoI	1837.81	kg/m3	348.60	Density of molten sulfur in the 334 508K range
rhoI	1835.41	kg/m3	350.80	Density of molten sulfur in the 334 508K range
rhoI	1833.18	kg/m3	352.80	Density of molten sulfur in the 334 508K range
rhoI	1830.97	kg/m3	354.80	Density of molten sulfur in the 334 508K range
rhoI	1829.77	kg/m3	356.90	Density of molten sulfur in the 334 508K range
rhoI	1828.24	kg/m3	358.90	Density of molten sulfur in the 334 508K range
rhoI	1823.16	kg/m3	361.00	Density of molten sulfur in the 334 508K range
rhoI	1823.16	kg/m3	363.10	Density of molten sulfur in the 334 508K range
rhoI	1821.81	kg/m3	365.10	Density of molten sulfur in the 334 508K range
rhoI	1821.14	kg/m3	367.30	Density of molten sulfur in the 334 508K range
rhoI	1817.43	kg/m3	369.30	Density of molten sulfur in the 334 508K range
rhoI	1815.76	kg/m3	371.30	Density of molten sulfur in the 334 508K range
rhoI	1813.41	kg/m3	373.40	Density of molten sulfur in the 334 508K range
rhoI	1810.74	kg/m3	375.40	Density of molten sulfur in the 334 508K range
rhoI	1809.08	kg/m3	377.50	Density of molten sulfur in the 334 508K range
rhoI	1808.41	kg/m3	379.50	Density of molten sulfur in the 334 508K range
rhoI	1807.08	kg/m3	381.60	Density of molten sulfur in the 334 508K range
rhoI	1804.76	kg/m3	383.80	Density of molten sulfur in the 334 508K range
rhoI	1801.46	kg/m3	385.80	Density of molten sulfur in the 334 508K range

rhoI	1798.16	kg/m3	387.80	Density of molten sulfur in the 334 508K range
rhoI	1795.87	kg/m3	389.90	Density of molten sulfur in the 334 508K range
rhoI	1794.55	kg/m3	391.90	Density of molten sulfur in the 334 508K range
rhoI	1792.92	kg/m3	394.00	Density of molten sulfur in the 334 508K range
rhoI	1789.33	kg/m3	396.10	Density of molten sulfur in the 334 508K range
rhoI	1788.19	kg/m3	398.10	Density of molten sulfur in the 334 508K range
rhoI	1787.06	kg/m3	400.20	Density of molten sulfur in the 334 508K range
rhoI	1784.95	kg/m3	402.20	Density of molten sulfur in the 334 508K range
rhoI	1782.84	kg/m3	404.30	Density of molten sulfur in the 334 508K range
rhoI	1780.59	kg/m3	406.40	Density of molten sulfur in the 334 508K range
rhoI	1778.65	kg/m3	408.40	Density of molten sulfur in the 334 508K range
rhoI	1777.37	kg/m3	410.50	Density of molten sulfur in the 334 508K range
rhoI	1777.05	kg/m3	412.50	Density of molten sulfur in the 334 508K range
rhoI	1774.16	kg/m3	414.60	Density of molten sulfur in the 334 508K range
rhoI	1770.65	kg/m3	416.70	Density of molten sulfur in the 334 508K range
rhoI	1770.01	kg/m3	418.70	Density of molten sulfur in the 334 508K range
rhoI	1766.51	kg/m3	420.80	Density of molten sulfur in the 334 508K range
rhoI	1768.10	kg/m3	422.80	Density of molten sulfur in the 334 508K range
rhoI	1765.25	kg/m3	424.90	Density of molten sulfur in the 334 508K range

rhoI	1762.40	kg/m3	426.90	Density of molten sulfur in the 334 508K range
rhoI	1761.77	kg/m3	429.10	Density of molten sulfur in the 334 508K range
rhoI	1760.03	kg/m3	431.00	Density of molten sulfur in the 334 508K range
rhoI	1759.56	kg/m3	433.10	Density of molten sulfur in the 334 508K range
rhoI	1759.25	kg/m3	435.10	Density of molten sulfur in the 334 508K range
rhoI	1757.99	kg/m3	437.30	Density of molten sulfur in the 334 508K range
rhoI	1756.73	kg/m3	439.30	Density of molten sulfur in the 334 508K range
rhoI	1755.79	kg/m3	441.30	Density of molten sulfur in the 334 508K range
rhoI	1757.05	kg/m3	443.40	Density of molten sulfur in the 334 508K range
rhoI	1756.11	kg/m3	445.40	Density of molten sulfur in the 334 508K range
rhoI	1754.85	kg/m3	447.50	Density of molten sulfur in the 334 508K range
rhoI	1751.57	kg/m3	449.60	Density of molten sulfur in the 334 508K range
rhoI	1751.57	kg/m3	451.60	Density of molten sulfur in the 334 508K range
rhoI	1751.10	kg/m3	453.80	Density of molten sulfur in the 334 508K range
rhoI	1749.55	kg/m3	455.80	Density of molten sulfur in the 334 508K range
rhoI	1747.68	kg/m3	457.80	Density of molten sulfur in the 334 508K range
rhoI	1748.21	kg/m3	459.90	Density of molten sulfur in the 334 508K range
rhoI	1746.13	kg/m3	461.90	Density of molten sulfur in the 334 508K range
rhoI	1744.89	kg/m3	464.00	Density of molten sulfur in the 334 508K range

rhoI	1743.04	kg/m3	466.00	Density of molten sulfur in the 334 508K range
rhoI	1740.57	kg/m3	468.10	Density of molten sulfur in the 334 508K range
rhoI	1742.73	kg/m3	470.30	Density of molten sulfur in the 334 508K range
rhoI	1739.95	kg/m3	472.30	Density of molten sulfur in the 334 508K range
rhoI	1740.57	kg/m3	474.30	Density of molten sulfur in the 334 508K range
rhoI	1739.65	kg/m3	476.30	Density of molten sulfur in the 334 508K range
rhoI	1737.49	kg/m3	478.40	Density of molten sulfur in the 334 508K range
rhoI	1737.95	kg/m3	480.40	Density of molten sulfur in the 334 508K range
rhoI	1736.88	kg/m3	481.50	Density of molten sulfur in the 334 508K range
rhoI	1735.96	kg/m3	482.50	Density of molten sulfur in the 334 508K range
rhoI	1735.35	kg/m3	483.50	Density of molten sulfur in the 334 508K range
rhoI	1736.88	kg/m3	484.60	Density of molten sulfur in the 334 508K range
rhoI	1734.74	kg/m3	485.60	Density of molten sulfur in the 334 508K range
rhoI	1730.46	kg/m3	486.60	Density of molten sulfur in the 334 508K range
rhoI	1731.83	kg/m3	487.80	Density of molten sulfur in the 334 508K range
rhoI	1731.68	kg/m3	488.80	Density of molten sulfur in the 334 508K range
rhoI	1728.64	kg/m3	489.80	Density of molten sulfur in the 334 508K range
rhoI	1728.94	kg/m3	490.80	Density of molten sulfur in the 334 508K range
rhoI	1728.64	kg/m3	491.80	Density of molten sulfur in the 334 508K range

rhoI	1727.73	kg/m3	492.80	Density of molten sulfur in the 334 508K range
rhoI	1727.12	kg/m3	493.80	Density of molten sulfur in the 334 508K range
rhoI	1727.58	kg/m3	494.90	Density of molten sulfur in the 334 508K range
rhoI	1728.03	kg/m3	495.90	Density of molten sulfur in the 334 508K range
rhoI	1726.67	kg/m3	496.90	Density of molten sulfur in the 334 508K range
rhoI	1725.30	kg/m3	498.00	Density of molten sulfur in the 334 508K range
rhoI	1724.70	kg/m3	499.00	Density of molten sulfur in the 334 508K range
rhoI	1723.49	kg/m3	500.00	Density of molten sulfur in the 334 508K range
rhoI	1724.09	kg/m3	501.00	Density of molten sulfur in the 334 508K range
rhoI	1722.89	kg/m3	502.10	Density of molten sulfur in the 334 508K range
rhoI	1721.98	kg/m3	503.10	Density of molten sulfur in the 334 508K range
rhoI	1721.53	kg/m3	504.10	Density of molten sulfur in the 334 508K range
rhoI	1719.87	kg/m3	505.30	Density of molten sulfur in the 334 508K range
rhoI	1720.17	kg/m3	506.30	Density of molten sulfur in the 334 508K range
rhoI	1717.47	kg/m3	507.30	Density of molten sulfur in the 334 508K range

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$

Coeff. A	1.60978e+01
Coeff. B	-7.97842e+03
Coeff. C	-2.28100e+01
Temperature range (K), min.	375.15
Temperature range (K), max.	717.15

Sources

Thermodynamic study in the Ag-Sb-S system by the EMF method: <https://www.doi.org/10.1016/j.jct.2016.03.009>
The Yaws Handbook of Vapor Pressure: <https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure>
Density of molten sulfur in the 334 508K range: <https://www.doi.org/10.1016/j.tca.2007.03.016>
Experimental redetermination of the gas-phase enthalpy of formation of ethylazide: <https://www.doi.org/10.1016/j.jct.2012.09.007>
Enthalpy of formation of natural hydrous copper sulfate: Chalcanthite: <https://www.doi.org/10.1016/j.jct.2015.12.010>
Solubility of elemental sulfur in pure organic solvents and organic solvents: <https://www.doi.org/10.1016/j.fluid.2011.09.012>
Experimental and computational thermodynamic study of two bisoxazolones: <https://www.doi.org/10.1016/j.jct.2018.01.022>
Experimental and computational thermodynamic properties of and enthalpy of formation of bisoxazolones: <https://www.doi.org/10.1016/j.jct.2013.11.006>
Standard molar enthalpies of formation of compounds: <http://webbook.nist.gov/cgi/cbook.cgi?ID=C7704349&Units=SI>
Gibbs free energy of formation of rhodium sulfides: <https://www.doi.org/10.1016/j.jct.2013.10.011>
Determination of the energies of combustion and enthalpies of formation of nitrobenzyl sulfonamides: <https://www.doi.org/10.1016/j.jct.2009.10.003>
Standard molar enthalpies of formation of compounds: <https://www.doi.org/10.1016/j.jct.2005.08.017>
Standard molar enthalpies of formation of compounds: <https://www.doi.org/10.1016/j.fluid.2008.05.001>
Thermochemical studies of three bis(O-alkyl-N-benzoylthiocarbamate)nickel(II) complexes: <https://www.doi.org/10.1016/j.jct.2004.04.001>
Experimental Studies of Solubility of Elemental Sulfur in Methane at 363.15 K for Pressure Ranging from (4 to 25) MPa: <https://www.doi.org/10.1021/jc201091g>
Standard molar enthalpies of formation of two crystalline forms of 4-nitro-2,1,3-benzothiadiazole: <https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1964>
Standard molar enthalpies of formation of two crystalline forms of 4-nitro-2,1,3-benzothiadiazole: <https://www.doi.org/10.1016/j.jct.2004.04.009>
Thermal stability of 4-nitro-2,1,3-benzothiadiazole: <https://www.doi.org/10.1016/j.fluid.2011.04.010>
Energetic and structural properties of 4-nitro-2,1,3-benzothiadiazole: <https://www.doi.org/10.1016/j.jct.2012.01.018>

Legend

af:	Acentric Factor
affp:	Proton affinity
basg:	Gas basicity
ea:	Electron affinity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
ie:	Ionization energy
pc:	Critical Pressure

pvap:	Vapor pressure
rhoc:	Critical density
rhoL:	Liquid Density
sgb:	Molar entropy at standard conditions (1 bar)
ss:	Solid phase molar entropy at standard conditions
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature

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