

## 2. Kinetic studies of the reaction of atomic sulfur with acetylene

By Ayling, Sean; Gao, Yide; Marshall, Paul

From [Proceedings of the Combustion Institute \(2015\), 35\(1\), 215-222](#). Language: English, Database: CAPLUS, DOI:10.1016/j.proci.2014.05.079

The rate const. for reaction of sulfur atoms with acetylene was measured. Laser flash photolysis of  $\text{CS}_2$  precursor was employed to generate ground-state  $\text{S}(^3\text{P})$  atoms, which were monitored with time-resolved resonance fluorescence as they reacted with  $\text{C}_2\text{H}_2$  in a large excess of Ar bath gas. Temps. from 295 to 1015 and pressures from 10 to 500 mbar were investigated. A pressure-dependence was obsd. at all temps., revealing that adduct formation is the dominant reaction channel. The necessary stability suggests  $\text{H}_2\text{CCS}$  or possibly  $\text{HCCSH}$  are the products at high temps., so that the reaction is spin-forbidden. The fall-off curves may be represented with a broadening factor  $F_{\text{cent}} = 0.6$ , and low and high-pressure limiting rate consts. of  $k_0 = 1.0 \times 10^{-18} (\text{T/K})^{-3.55} \exp(-1990 \text{ K/T}) \text{ cm}^6 \text{ mol}^{-2} \text{ s}^{-1}$  and  $k_{\infty} = 2.1 \times 10^{-11} \exp(-11.2 \text{ kJ mol}^{-1}/\text{RT}) \text{ cm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ , resp. An entrance barrier to recombination of about  $10 \text{ kJ mol}^{-1}$  is proposed to arise where the singlet and triplet potential energy curves cross.

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## 16. Effect of organic sulfur compounds on the removal of nitric oxide and acetylene from coking gas by catalytic hydrogenation

By Semenova, T. A.; Markina, M. I.; Lileikina, T. N.; Gorbacheva, N. B.; Gerasimova, A. V.

From [Khimicheskaya Promyshlennost \(Moscow, Russian Federation\) \(1967\), 43\(10\), 730-3](#). Language: Russian, Database: CAPLUS

The effect of thiophene, EtSH, and  $\text{CS}_2$  on the removal of NO and  $\text{C}_2\text{H}_2$  from the mixt. of gases used for  $\text{NH}_3$  production was detd. by measuring the degree of NO and  $\text{C}_2\text{H}_2$  hydrogenation at 100-250° and different concns. of the  $\text{S}$  compds. The catalysts contained 0.05% and 0.1% Pd and 0.1% Ru. At 150° in the presence of  $\text{CS}_2$ ,  $\text{C}_2\text{H}_2$  was fully reduced to  $\text{C}_2\text{H}_4$ . The latter was not hydrogenated at all when the gas mixt. contained 180-220 mg.  $\text{CS}_2/\text{m}^3$ . All the  $\text{S}$  compds. studied reduced the degree of NO hydrogenation. Reaction of  $\text{CS}_2$  with  $\text{C}_2\text{H}_2$  and  $\text{C}_2\text{H}_4$  to form mercaptans was not noticed in N, but was appreciable in H.

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## 19. Carbon disulfide

By Lauer, James L.

From [No Corporate Source data available \(1966\), US 3231482 19660125](#), Language: Unavailable, Database: CAPLUS

When subjected to mech. shock waves which supply heat and pressure for the endothermic reaction, an aliphatic hydrocarbon and an  $\text{S}$ -contg. compd., which does not decomp. to give O, form  $\text{CS}_2$ . Thus, H at 420° and 12 atm. is introduced into the reaction tubes of a wave engine which contain a 1:2 mixt. of  $\text{CH}_4$  and  $\text{H}_2\text{S}$  at 420° and 1 atm. The mixt. is thereby shock-compressed to 8 atm., and its temp. is raised to 990°.  $\text{CS}_2$ ,  $\text{S}$ ,  $\text{C}_2\text{H}_2$ , and  $\text{C}_2\text{H}_4$  are formed. The reaction is quenched when the products are cooled by rapid release from the tubes.

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## 27. Production of thiophene by the interaction of acetylene and carbon disulfide

By Briscoe, Henry V. A.; Peel, John B.; Robinson, Percy L.

From [Journal of the Chemical Society \(1928\), 2857-8](#). Language: Unavailable, Database: CAPLUS, DOI:10.1039/JR9280002857

cf. C. A. 22, 4460. The small proportion of thiophene that is formed from  $\text{C}_2\text{H}_2$  and  $\text{S}$  vapor is produced probably by a direct reaction of  $\text{C}_2\text{H}_2$  and  $\text{S}$  and not by a secondary reaction between the gas and  $\text{CS}_2$ .  $\text{C}_2\text{H}_2$  satd. with  $\text{CS}_2$  was passed through tubes heated to any desired temp. up to 800°; at 200° the liquid contained only unchanged  $\text{CS}_2$ ; at 360° a trace of thiophene appeared; at 700° there was present approx. 10% by vol. of thiophene. The yield could not be increased by the use of bauxite or granular  $\text{CuS}$  as the furnace packing.

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**28. Reaction between acetylene and sulfur at temperatures up to 650°**

By Peel, John B.; Robinson, Percy L.

From [Journal of the Chemical Society \(1928\)](#), 2068-70. Language: Unavailable, Database: CAPLUS, DOI:10.1039/JR9280002068

cf. Briscoe and Peel, C. A. 22, 3657. In the reaction between S and  $C_2H_2$ , the liquid condensed at lab. temp. contains  $CS_2$  (I), thiophene(II) and thiophthene (III). At about 325°, 38% of the S was converted into a brown oil, contg. 77% I, 9% II and 6% III; at 500°, 74% of the S was converted into a brown oil, contg. 77% I, 12% II and 6% III; at 650°, 77% of the S was converted into a product contg. 83% I, 5% II and 3% III. The remaining S probably converts the  $C_2H_2$  into C and  $H_2S$ . II has  $d_4^{20}$  1.0615,  $\gamma_{20}$  32.58; these data give a mol. parachor of 189.0 and the parachor of S as 46.5.

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**30. Carbon disulfide, etc.**

By Komlos, J.; Komlos, A.; Engelke, E. F.

From [No Corporate Source data available \(1926\)](#), GB 265994 19260215, Language: Unavailable, Database: CAPLUS

$CS_2$  and  $H_2S$  are formed by heating S or metallic sulfides with org. compds. such as hydrocarbons of the  $C_2H_2$  series, with or without catalysts.  $C_2H_2$  may be burned in S vapor or vice versa. Hydrocarbons of high mol. wt. or their derivs. are also obtained as by-products and if N or  $NH_3$  is present HCN or HCNS is formed as they may be also if org. N compds. and S or sulfides are used as starting materials. Pyrites and low-grade S-bearing earths may be used in the process.

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