87-080882/12　E36 H01 J01 (E35)　RUHR 14.09.85 RUHRCHEMIE AG　*DE 3532-955-A 14.09.85-DE-532955 *(19.03.87)* B01d-53/14 C10k-01/16 Removing hydrogen sulphide, carbonyl sulphide and hydrogen cyanide - esp. from synthesis gas, by absorption by aldehyde(s), e.g. giving prod. harmless to hydroformylation catalyst C87-033571	E(10-D1D, 10-J2D, 11-Q2, 31-A1, 31-A2, 31-F1B, 31-N5B, 32-B) H(1-F1, 9-D) J(1-E3B)

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Purificn. process for gases contg. H_2S and/or COS and/or HCN as impurity comprises treating at 1-10 (pref. 1.5-8) MPa and 30-100 (pref. 50-80)°C in an extn. column in counter-current with a satd. aldehyde or a mixt. of such aldehydes, which is liq. under the process conditions.

USE/ADVANTAGE
Process is useful for purificn. of hydrocarbons (e.g. natural gas) H_2, CO, CO_2 and esp. synthesis gas. Usual levels of the order 100 vol. ppm of H_2S, COS or HCN can be reduced to less than 1 vol. ppm, i.e. to levels harmless to catalysts. Pref. is an initial purificn. to a concn. of 5-10 ppm impurity using a prior art physical or chemical absorbent, followed by the present process.

PROCESS
Pref. at least 0.5 l (esp. 1-2 l) of aldehyde are added to

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treat 1 m^3 of the gas to be purified. The aldehyde is pref. 4-10C and need not be pure. Esp. useful are the mixts. of n- and iso-aldehydes obtd. by hydroformylation of olefins. The extn. column can be packed with rings, saddles or steel helices. The aldehyde may be regenerated after use by distn.: H_2S and COS are lost overhead, and HCN remains in the bottoms, combined as the cyanhydrin.

EXAMPLE
To the top of an extn. column packed with Raschig rings, at 5.2 MPa and 35°C, 8 l/h of a mixt. of 95 wt.% n- and 5 wt.% iso-butyraldehyde was fed. 5 m^3/h of synthesis gas contg. (mg/m^3) 1 HCN, 0.8 H_2S and 1.5 COS was passed up the column. In the effleunt gas the 3 impurities could not be detected. The gas could then be used for Rh-catalysed olefin hydroformylation: in contrast to the gas before purificn., it did not reduce the catalyst activity.(3pp1492 RKMHDwgNo.0/0).

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