

**ABSTRACT OF THE DISCLOSURE**

A process for converting hydrogen sulfide which is contained in a gaseous feed stream to elemental sulfur and hydrogen. The process comprises contacting said gaseous feed stream with a polar organic solvent having an anthraquinone, and optionally a complexing agent, dissolved therein, reacting the hydrogen sulfide gas and anthraquinone to produce sulfur and an anthrahydroquinone in the solvent, and catalytically dehydrogenating the anthrahydroquinone to anthraquinone and hydrogen. In accordance with the present invention, a relatively small quantity of water is added to a polar organic solvent thereby increasing the elemental sulfur which is precipitated and thus recovered. The addition of water prior to or during sulfur production also increases hydrogen product selectivity in the subsequent dehydrogenation of anthrahydroquinone.

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