

A process for the removal of sulphur compounds from a residual gas with recovery of said compounds in the form of sulphur, which process comprises subjecting the residual gas to a combined hydrogenation and hydrolysis to convert the sulphur compounds which it contains to H_2S , recovering a gaseous effluent containing H_2S as the sole sulphur compound and water vapor, cooling the gaseous effluent to a temperature between the dew point θ of the water in said gaseous effluent and 180°C , wherein the water vapor is not condensed, mixing the gaseous effluent with a gas containing free oxygen to provide an $\text{O}_2:\text{H}_2\text{S}$ molar ratio between 0.5 and 3.0, contacting the cooled gaseous effluent and the gas containing free oxygen with a catalyst for selective oxidation of H_2S to sulphur at a temperature between θ and 180°C , depositing virtually all of the sulphur formed on the catalyst and obtaining a purified gas stream substantially free of H_2S .