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## PURIFICATION OF SULPHUR DIOXIDE GASES

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The present invention relates to a process of purifying sulphur dioxide gases as they are obtained by roasting ores and the like.

For the purification of the said roasting gases in order to catalytically convert them into sulphuric acid, it has been proposed to introduce sulphur trioxide into the gases. In order to cool down the hot gases coming from the roasting process and to precipitate suspended substances, the gases are, prior to the supply of sulphur trioxide, treated with sulphuric acids of increasing strength in trickling towers and then purified in iron tubes by electric precipitation.

The pretreatment must be carried out in lead-lined towers or brick-lined leaded towers, the said acids of increasing strength being fed through leaden pumps. As the gas in the towers has only a comparatively low speed of flow, the mist contained or formed therein is for their greater part precipitated. The sulphuric acid mist contained in the roasting gas is thus lost as a precipitant for the subsequent electric purification. In their place, therefore, new mist must be produced by a supply of sulphur trioxide and water or dilute acid, which means a comparatievly high expenditure of sulphur trioxide. For this reason and because of the comparatively high expense for equipment and lead, the process could not be adopted in practice.

I have now found that the cooling and purification of the roasting gases may be carried out in iron apparatus if the gases, either in the roasting furnaces or between or behind the dust chambers, are admixed with sulphur trioxide in such an amount that the precipitated sulphuric acid has a concentration of at least about 88 per cent. of $H_2SO_4$. The contaminations contained in the roasting gas are thereupon all separated out in iron tubes by the electric purification, together with the sulphuric acid precipitating, the concentration of which practically ranges between 88 and 96 per cent. The proportion of impure acid obtained only amounts to about 7 to 8 per cent. of the products. This acid may be purified in known manner. The process in accordance with my present invention makes lead practically dispensable as a constructional material in the erection of a plant for the catalytic production of sulphuric acid. For the said reason and, moreover, by avoiding the arrangement of several trickling towers, connected in series and being fed by large amounts of acid, the cost for the plant is essentially cut down.

For the electric purification of roasting gases with a view of removing arsenic, selenium and the like, it has been proposed to add sulphur trioxide, whether in all refining stages or only in the last stage. This known process only concerns the final treatment of the gases and not the problem of carrying through the whole course of working up the gases so as to carry out the purification completely in iron apparatus, as is the case in the process according to the present invention. According to my process the sulphur trioxide is added to the roasting gases already before their cooling and electric purification, i. e. in the roasting furnace or between or behind the dust chambers.

The following example serves to illustrate how my present invention may be carried out in practice, but the invention is not restricted to this example.

*Example*

A gas obtained by roasting pyrite and coming from the dust chambers connected to the roasting furnace with a content of 8.5 per cent. of sulphur dioxide, is given an addition of 12 grams of sulphur trioxide per each cubic meter at about 200°C. The gas is then cooled in a wrought-iron cooler to about 35°C and then passed through a wrought-iron chamber fitted with sparkling wires being under a tension of 10,000 volts.

The gas thus purified contains only 0.0002 per cent. of arsenic. In the purification 34 grams of a 96 per cent. sulphuric acid are formed per each cubic meter of roasting gas. This acid contains about 0.22 per cent. of arsenic which is eliminated in the usual manner.

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