

## **Abstract**

The catalytic oxidation of carbon monoxide to carbon dioxide is an important reaction technologically and environmentally. The heterogeneous oxidation of carbon monoxide by different metal oxides and mixed metal oxides has been investigated. These metal oxides include hydrous ruthenium dioxide, hydrous cobalt oxide as well as hydrous Ru-Co mixed oxide.

Hydrous ruthenium dioxide and hydrous cobalt oxide were prepared by precipitation from an aqueous solution of  $\text{RuCl}_3$  and  $\text{CoCl}_2$  respectively with  $\text{NaOH}$  in the presence of neutral  $\gamma$ -alumina,  $\gamma\text{-Al}_2\text{O}_3\text{-n}$ . Bulk or supported on  $\gamma\text{-Al}_2\text{O}_3\text{-n}$  hydrous Ru-Co mixed oxides were prepared by co-precipitation from an aqueous solution of  $\text{RuCl}_3$  and  $\text{CoCl}_2$ . The metal content was determined by Inductive Coupled Plasma (ICP) and the water content of bulk Ru-Co binary oxides was determined by Thermogravimetric Analysis (TGA).

It was found that the bulk Ru-Co binary oxides had much higher activity per 1 g catalyst than all the catalysts used in this study. It was also found that increasing the metal percentage in supported catalysts led to an increase in activity. In addition, it was noticed that ruthenium containing catalysts had high reusability. In contrast, the activity of catalysts containing only cobalt underwent deactivation.