



Characterisation of Copper-Zinc-Hydroxycarbonates obtained at various preparation steps and procedures by thermal decomposition

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Abstract:

Mixed copper-zinc hydroxycarbonates are well known precursors for the preparation of ZnO supported Cu catalyst. The correlation between chemical and structural identity of these precursors originating from the precipitation procedure and the activity of the final catalyst, however, is still unclear. Strictest control of the preparation parameters is before a mandatory prerequisite to elucidate unambiguously the influence of the various conditions on the nature of the precipitates. Thermal decomposition is not only an important treatment step towards the catalyst it also provides detailed characteristics when investigated by hyphenated techniques like coupled TG-MS measurements. We studied two differently prepared series of precursors with varying Cu/Zn ratio prepared according to the precipitation method using digital process control. In addition, samples at selected preparation steps were examined focusing on the effects of the post-precipitation procedures of aging and washing. The TG-MS data nicely reflect the differences of the distribution of the X-ray crystalline phases rosasite ($((\text{Cu}_x\text{Zn}^{1-x})_2(\text{OH})_2\text{CO}_3)$) and aurichalcite ($((\text{Cu}_x\text{Zn}^{1-x})_5(\text{OH})_6(\text{CO}_3)_2)$) from the two series. However, distinctly different compositions concerning the anionic parts were found. Copper rich samples prepared at constant pH exhibit a deficiency of hydroxyde and an enrichment of hydroxyde at copper contents.