

# Catalytic effect of [trans-Cu( $\mu$ -OH)( $\mu$ -dmpz)]<sub>6</sub> on the thermal decomposition of ammonium perchlorate

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## Abstract

Spatial race under low oxygen conditions requires solid mild propellants to be used. Therefore, we study the catalytic effect of the previously reported [trans-Cu( $\mu$ -OH)( $\mu$ -dmpz)]<sub>6</sub> complex on the thermal decomposition of ammonium perchlorate by a differential scanning calorimetry (DSC) technique. The copper compound causes a decrease of ammonium perchlorate's decomposition temperature to 372.5 °C, consequently increasing the heat release by 576 J·g<sup>-1</sup>, when used in a 5 wt% as burning rate (BR) catalyst. It must be remarked that, the [trans-Cu( $\mu$ -OH)( $\mu$ -dmpz)]<sub>6</sub> complex presents a superior performance as BR catalyst when compared to nano-metallic oxides. This Cu<sup>(II)</sup> compound modifies the decomposition mechanism of ammonium perchlorate, providing the necessary O<sub>2</sub> to accelerate the overall burning process paving the way to the study of copper pyrazolate complexes as BR catalysts. © 2021 Elsevier Ltd

## Author keywords

Ammonium perchlorate; Burning rate catalysts; Cluster