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Deactivation mechanism and regeneration of carbon nanocomposite catalyst for acetylene hydrochlorination

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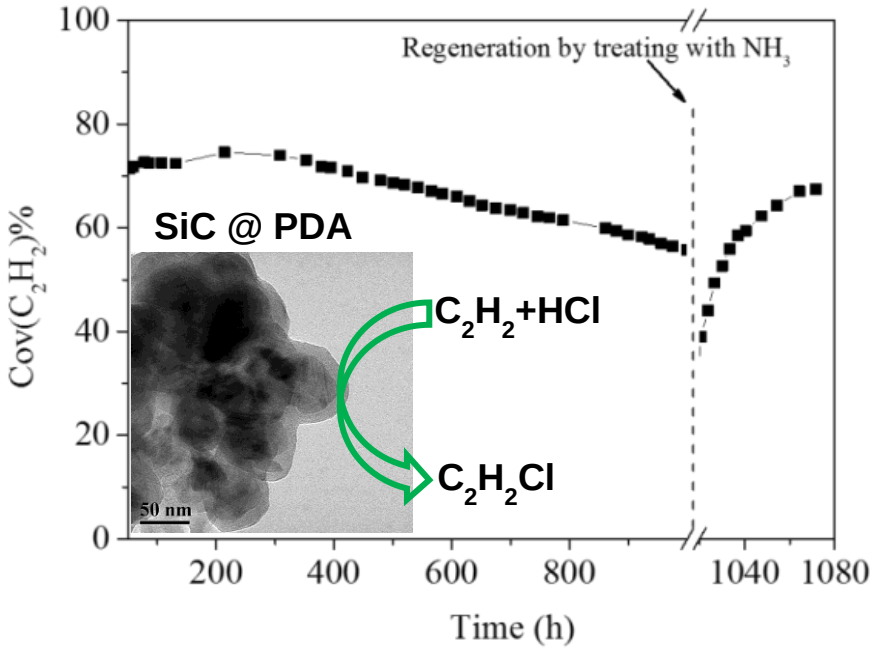
Acetylene hydrochlorination is an important coal-based technology for production of vinyl chloride, the monomer of the world third mostly used plastics. Despite of the great potentials demonstrated for carbon-based catalysts to replace the toxic mercury chloride, the stability and the deactivation mechanism are rarely discussed, which is essential for real applications. Herein, we present a detailed study on the deactivation mechanism of nitrogen doped carbon based catalyst in acetylene hydrochlorination. The results show that the deactivation was likely caused by the carbon-like deposition over the catalyst, which can be regenerated with high temperature NH_3 treatment.

Graphical Abstract

<InlineShape1>



Highlights

- A novel composite SiC@PDA is prepared.
- The composite showed good activity as metal free catalyst in acetylene hydrochlorination.