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Preparation of the recycled and regenerated mesocarbon microbeads-based solid acid and its catalytic behaviors for hydrolysis of cellulose

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Highlights:

- Solid acid with high acid density can be prepared using MCMB with good properties.
- MCMB-based solid acid exhibited excellent catalytic ability for cellulose.
- MCMB-based solid acid demonstrated good recyclability and regeneration abilities.
- The yield of TRS of hydrolysis reached 66.7% for pretreated cellulose.

Abstract

Mesocarbon microbeads (MCMB) from coal tar pitch have excellent mechanical strength, high density, and good thermal stability. Moreover, a great deal of aromatic constituents occur on its surface, favoring the substitution reaction of sulfonic group. Results showed that the total acid and $-\text{SO}_3\text{H}$ amount was 4.36 mmol/g and 2.18 mmol/g, respectively. Moreover, the yield of total reducing sugar (TRS) and

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