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## Superamphiphobic nanocellulose aerogels loaded with silica nanoparticles

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摘要	Superamphiphobic aerogels of cellulose nanofibrils (CNF) were successfully fabricated based on their porous rough structure via the chemical vapor deposition of fluorosilane reagent. FE-SEM images show the protruding nano-filaments, micron fibrils and sheet-like layers in the nanocellulose aerogel constitute the micro-nano hierarchical structure, which is critically important for the superamphiphobic performance. The lyophobicity increases with an increase in the nanocellulose concentration within the range of 0.5-2.0 wt%. For the fluorinated aerogel with CNF concentration of 2.0 wt%, the contact angles of water, castor oil, and hexdecane reach 163 degrees, 154 degrees and 143 degrees, respectively. In addition, the loading of SiO <sub>2</sub> nanoparticles in the CNF aerogels was conducted to increase the proportion of the nanoscale protuberance on the aerogel surface. The combination of nanocellulose and the loaded SiO <sub>2</sub> nanoparticles optimizes the micro-nano hierarchical structure, which further improves the superamphiphobic performance with the contact angle of hexdecane reaching 150 degrees. The superamphiphobic CNF-based composite aerogels with excellent liquid repellency for both water and oil can be used as potential self-cleaning substrates in the fields of gas sensors, catalysis, supercapacitor, and etc.
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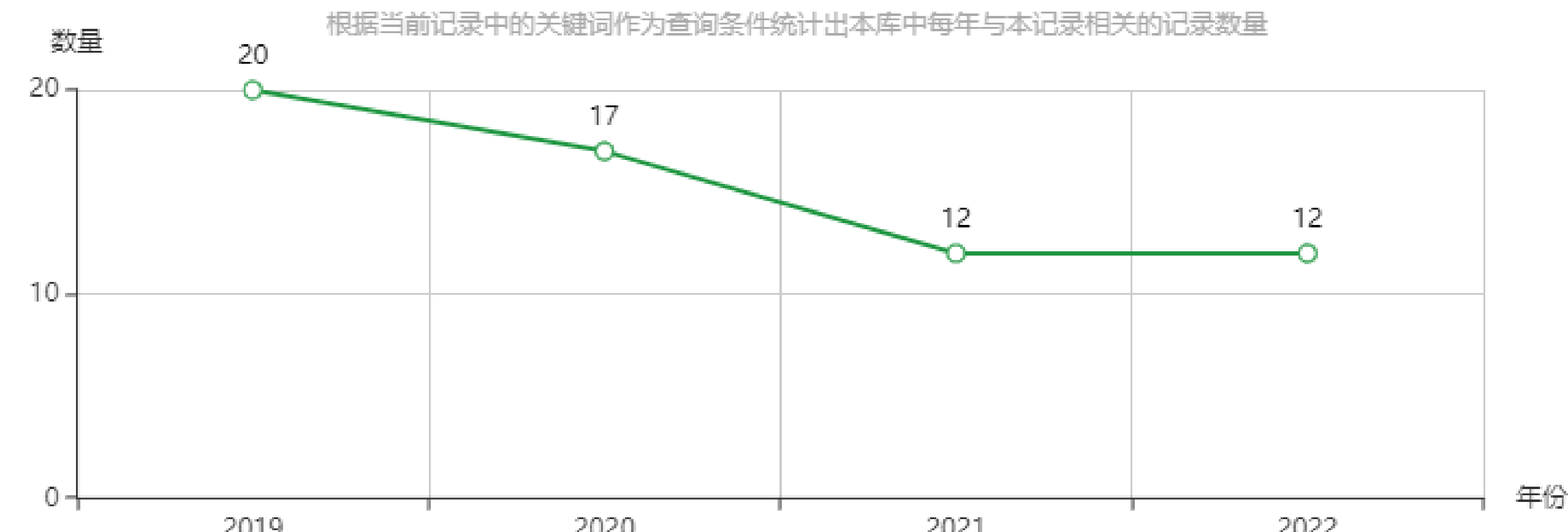
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