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Review

Recent advances in aerogels for environmental remediation applications: A review

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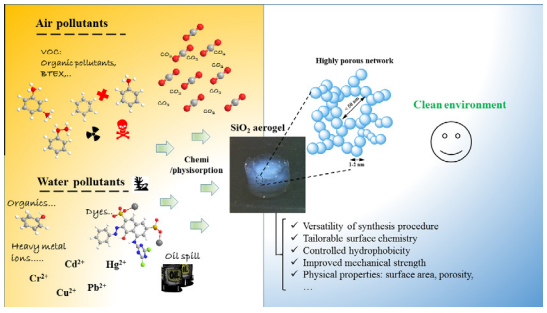
HIGHLIGHTS

- High porosity, high surface area, and low density make aerogel an effective sorbent.
- Aerogels are employed as an adsorbent to remove VOC from the air.
- Aerogels are extensively considered for CO_2 capture.
- Aerogels are used for removal of the oil spill and toxic organic compounds from water.
- Aerogels are employed for removal of heavy metal ions from wastewaters.

GRAPHICAL ABSTRACT



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ABSTRACT

Aerogels are an exceptional class of porous material with a number of excellent physicochemical properties such as low density, high porosity, high surface area and adjustable surface chemistry. By recent advances in the synthesis of different types of aerogel, the feasibility of this porous material on the several applications have been widely explored. Among the various high-performance applications, aerogel has drawn significant attentions as an adsorption media for removal of several environmental and human health-threatening pollutants. Although, aerogel performance for environmental remediation are promising, some drawbacks of aerogels such as intricate drying process, mechanically delicate structure and, processing cost have also taken into account and, have been abated at a certain way in the several studies.

This review article aims at giving an overview regarding the aerogels synthesis, processing and their recent applications in air cleaning such as CO_2 capture and VOC removal and, in water treatment including oil and toxic organic compounds and heavy metal ions removal.

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