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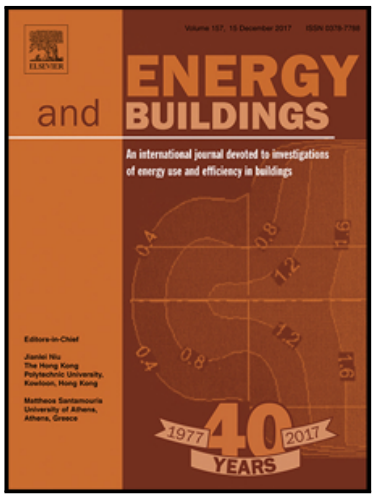

A novel building material with low thermal conductivity: Rapid synthesis of foam concrete reinforced silica aerogel and energy performance simulation

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Highlights

- Foam concrete reinforced silica aerogel (FC-SA) has been prepared using a combined sol-gel route, vacuum impregnation method and fast ethanol supercritical drying technique.
- The foam concrete reinforced silica aerogel has a surface area of 405.3 m^2/g.
- The thermal conductivities of FC-SA is as low as 0.049 $W \cdot m^{-1} \cdot K^{-1}$ (30 °C).
- In cold and hot areas, the use of FC-SA to replace traditional concrete materials can greatly reduce both of space heating/cooling energy consumption and cooling water consumption.

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