

CARBON DIOXIDE CAPTURE USING SOLID ADSORBENTS

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One of the technologies for CO₂ capturing from flue gas and waste gases is their adsorption on solid adsorbents. This technology can be used both for low flue gas temperatures and for high flue gas temperatures. For low-temperature adsorption, power plant fly ash, which is available in large quantities, is most often used as adsorbent. Ashes containing higher concentrations of calcium oxide, which are produced in additive flue gas desulphurization technologies, are especially suitable adsorbents.

Calcium carbonate and magnesium carbonate are mainly used as adsorbents for high-temperature CO₂ adsorption, which takes place in the temperature range from 650 to 900 °C. These adsorbents are first converted to appropriate oxides by calcination, which are subsequently used as sorbents for CO₂ chemisorption. This technology, called as the high-temperature carbonate loop, is particularly suitable for CO₂ capturing from waste gases with a high CO₂ concentration and high temperature. Such gases are produced, for example, in cement plants.