POST-COMBUSTION CAPTURE OF CARBON DIOXIDE

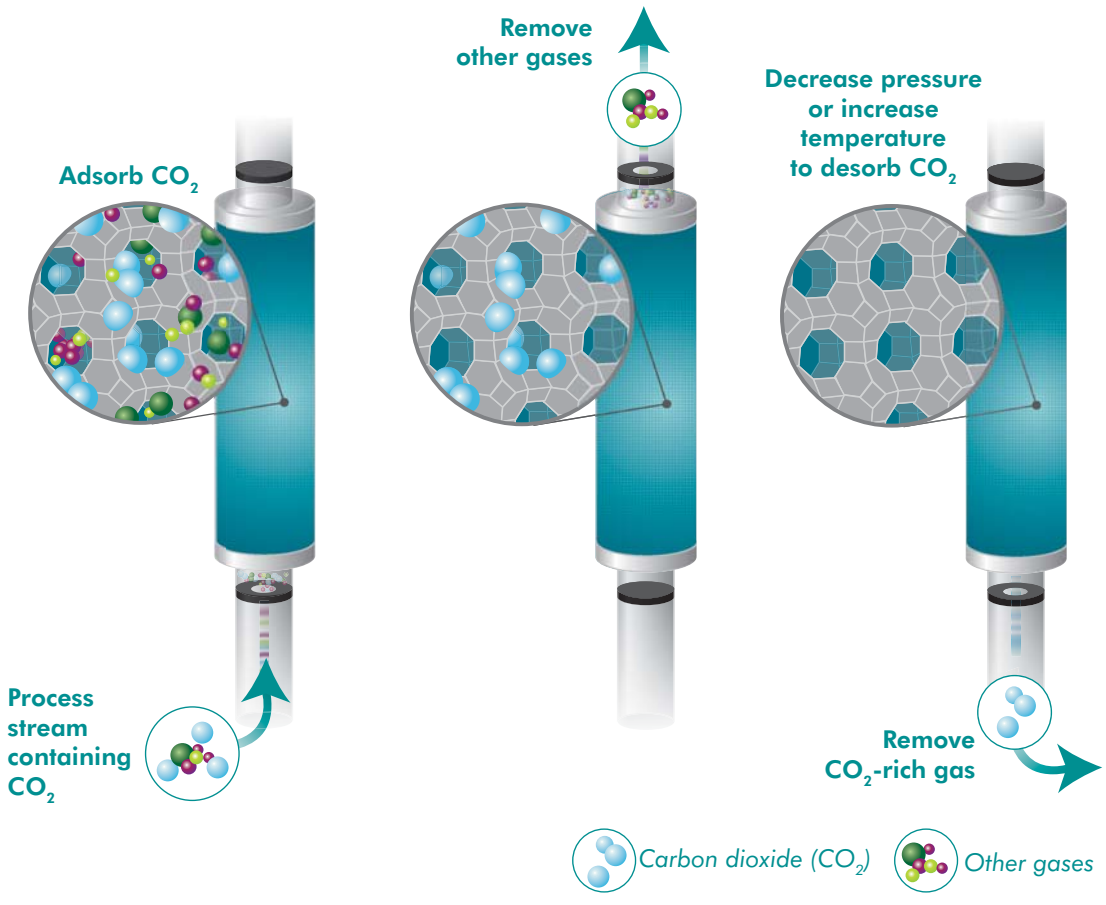
Adsorption technologies

Adsorbent capture technologies for separating carbon dioxide (CO_2) from industrial gas streams have the potential to be highly cost-effective, as they require less energy and could have less impact on the environment.

Adsorbents are solids, typically minerals called zeolites, that can capture CO_2 on their surface, release the CO_2 following a change in temperature or pressure and be reused in a cyclical process.

In current CO2CRC trials, the CO_2 is released from the adsorption material by reducing the pressure. This is known as Pressure Swing Adsorption (PSA) or, where the pressure is reduced to very low pressure, Vacuum Swing Adsorption (VSA). This process is widely used in air separation, natural gas purification and hydrogen gas generation.

In current CO2CRC trials, the adsorber column contains multiple layers to deal with the complex composition of the flue gas.



Principles of adsorption.

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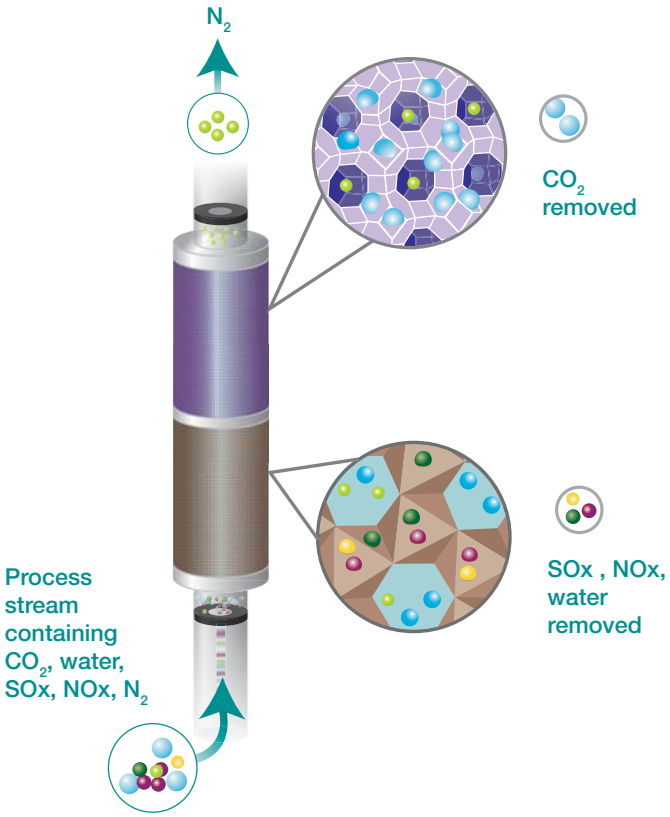

A water-selective and acidic gas-resistant adsorbent is used to remove the water and the SOx and NOx in the flue gas.

The CO2CRC H3 Capture Project at International Power's Hazelwood Power Station is conducting research into adsorption technologies for CO_2 capture. The project aims to:

- demonstrate adsorption for CO_2 capture from flue gas;
- assess adsorption process, equipment and different adsorbents under various working conditions and equipment configurations;
- assess effect of impurities, temperature and load on the vacuum swing adsorption process; and
- assess economic and engineering issues for scale-up.

The project is part of the Latrobe Valley Post-combustion Capture Project and is supported by the Victorian Government, through their Energy Technology Innovation Strategy (ETIS) Brown Coal R&D funding.

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