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Coal degasing

Coking process

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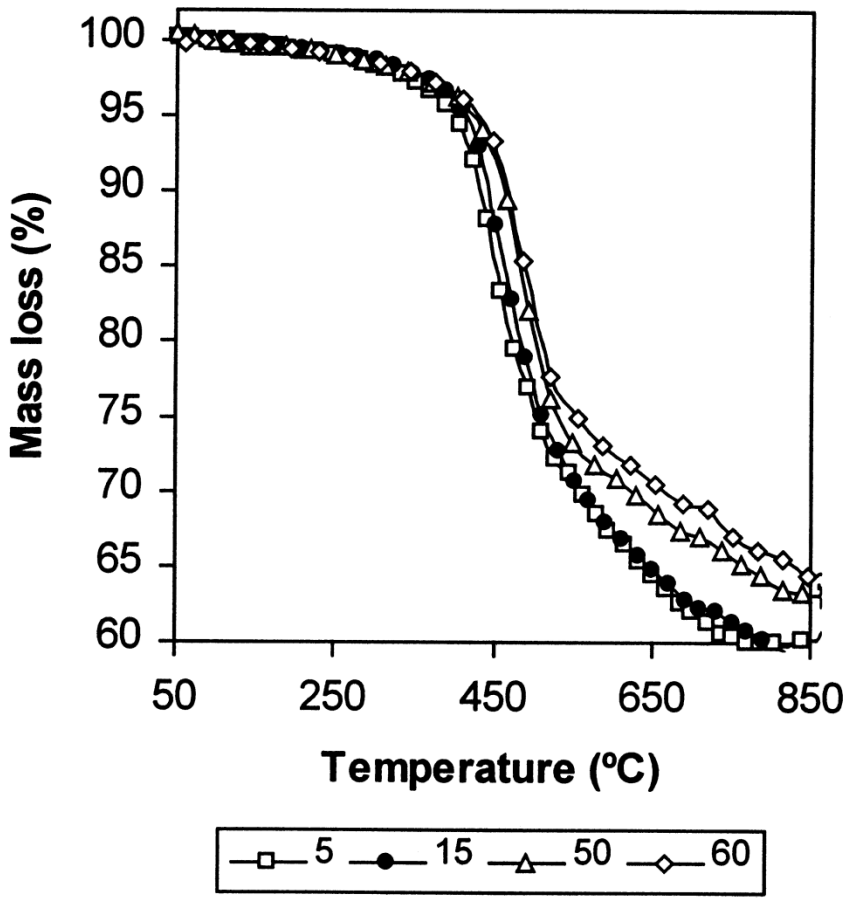
Coal degasing - pyrolysis

Degasing is the proces in which carbonaceous materials are outgased

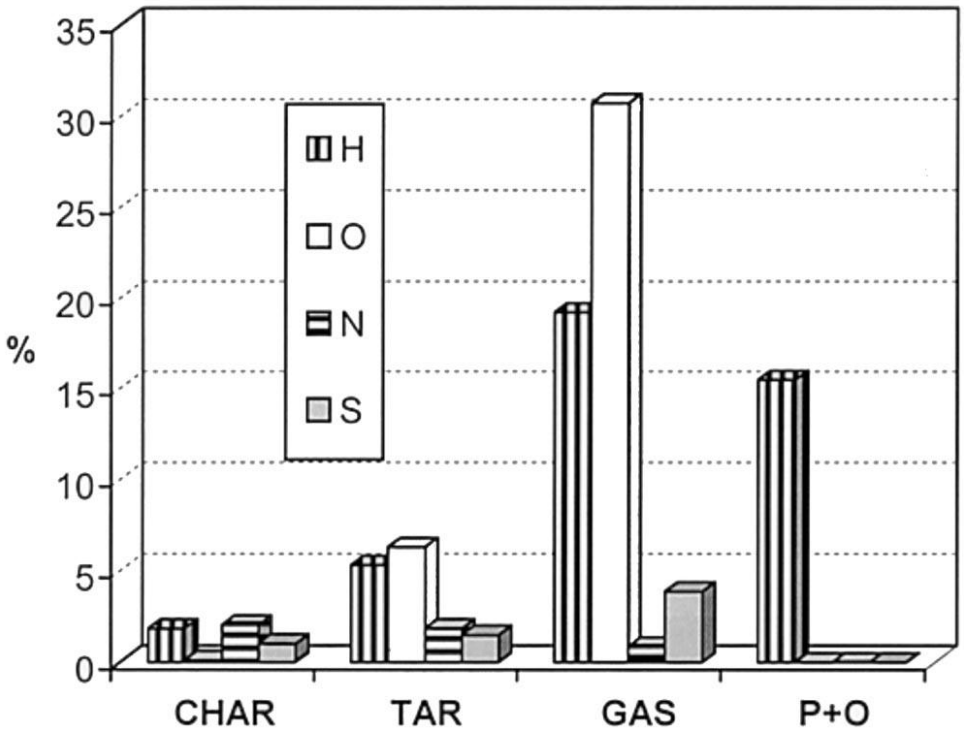
Coal degasing - pyrolysis



- about 105°C water is evaporated at temp.
- up to about 200°C occluded gase are released
- up to 350°C CO_2 and H_2S are produced from elements present in surface groups
- 350-500°C primary decomposition of organic matter - HC are produced (tar, decay water)
- over 500°C secondary outgasing with produce of CH_4 (peak at 570°C) and H_2 (peak at 810°C)

A. Arenillas et al. : J. Anal. Appl. Pyrolysis 58–59 (2001) 685–701

Coal degasing - pyrolysis



- Hydrogen is mainly distributed to gas and short chain HC (Parafines and Olefines)
- Oxygen generaly to tar and gas (CO_2)
- Nitrogen migrate to
  - tar
  - gas (ammonia water)
- Sulphur enrich the gas in different compounds

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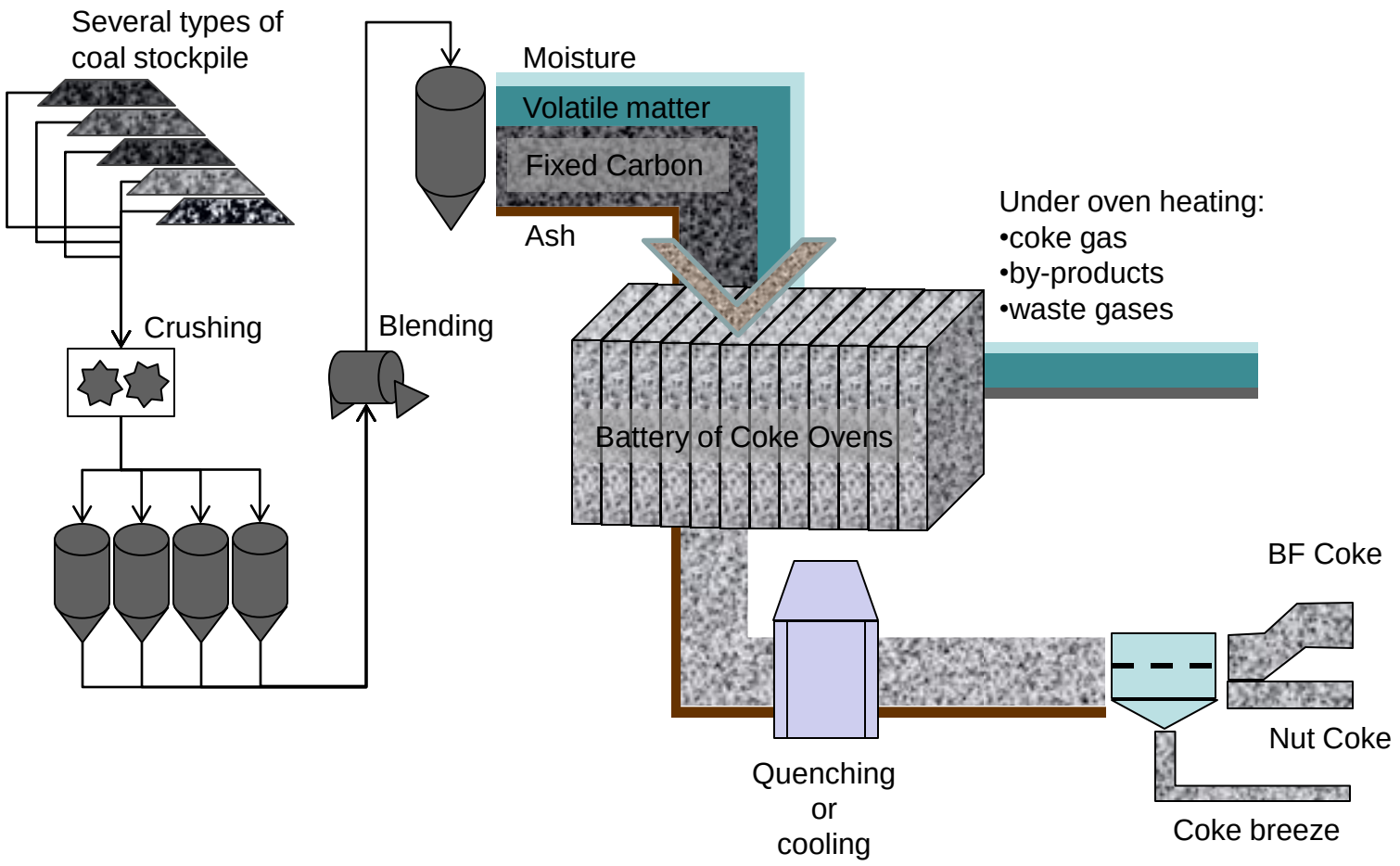
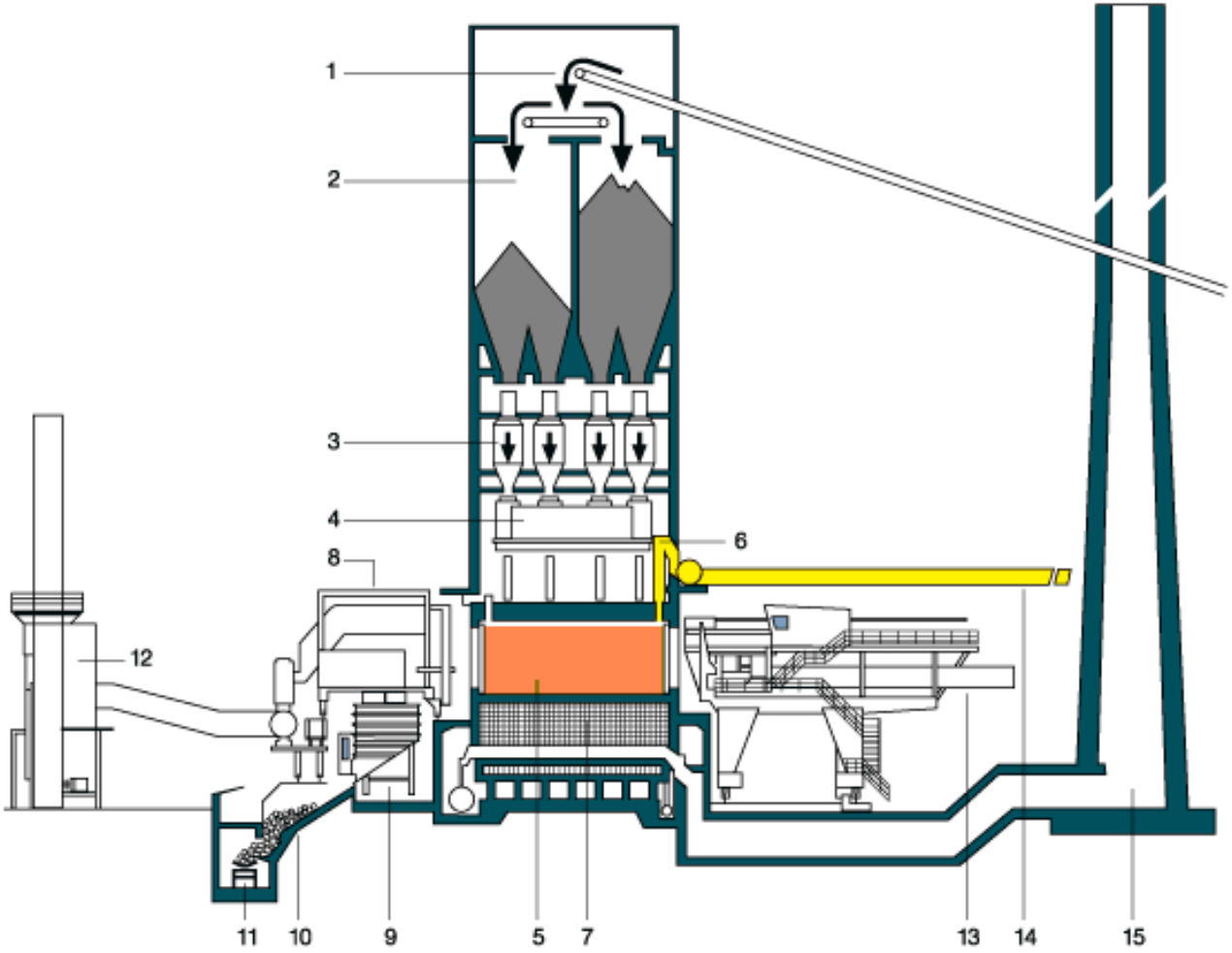
Coking plant scheme



http://www.coaltech.com.au/Cokemaking.html

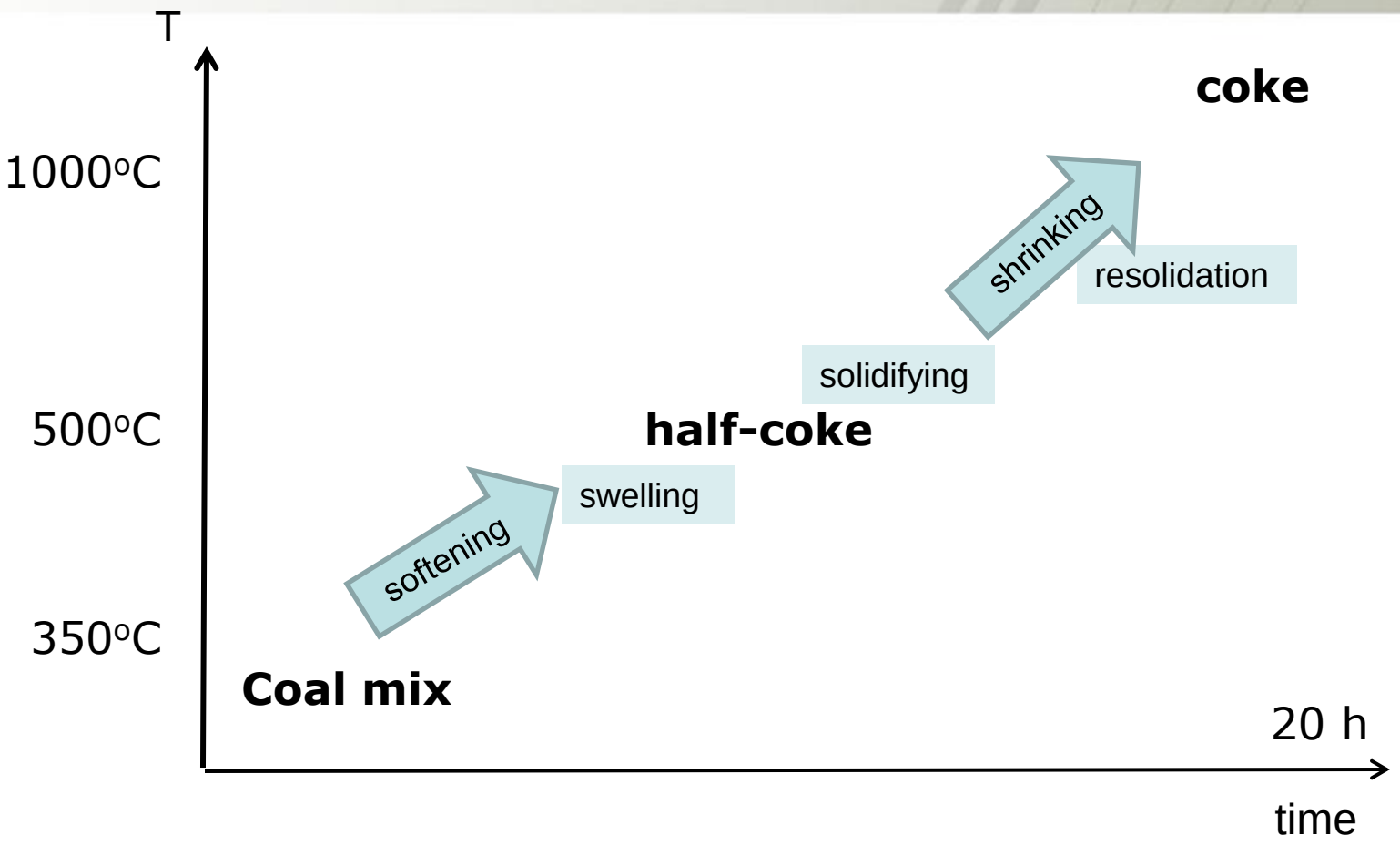
Coking plant scheme
vertical cross-section



1. Coal from the mixing and grinding plant
2. Coal bunker
3. Weighing containers
4. Charging car
5. Coke oven chamber
6. Riser
7. Regenerator
8. Transfer machine
9. Quenching car
10. Coke wharf
11. Coke for the blast furnace
12. Dedusting of coke output
13. Coke pusher
14. Gas for the coal by products plant
15. Chimney

http://www.salzgitter-flachstahl.de/en/Ueber_uns/Produktionsanlagen/Kokerei/

Phases of coking



Coking - products

General components:

- gas-coking coal
- ortho-coking coal (3 types)
- high-carbon coal (2 types)

up to 12 components

Product by weight ratio:

- coke – 70-80%
- coal tar – 2,5-4,5%
- condensed water – 3-5%
- ammonia – 0,2-0,4%
- benzol – 0,8-1,4%
- coke gas– 12-18%