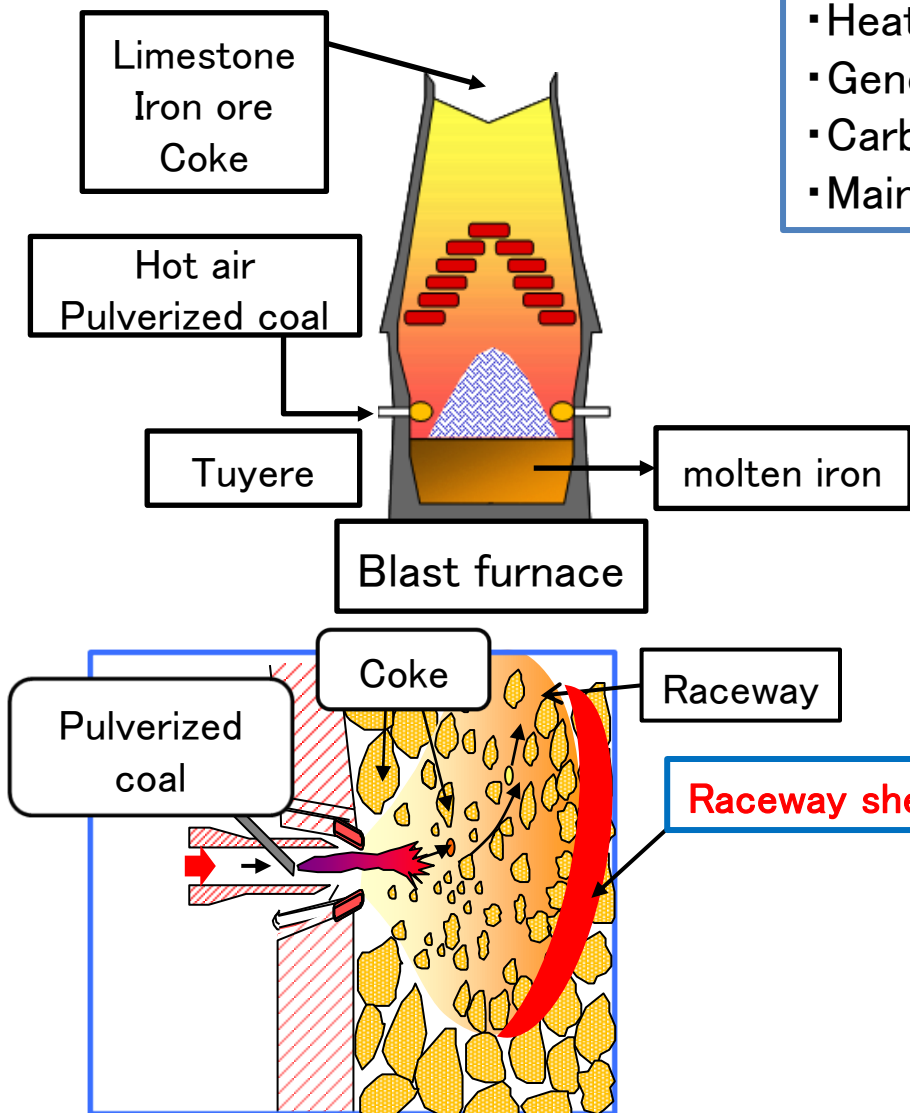


Ash particle behavior in reaction process of coke

Ironmaking process

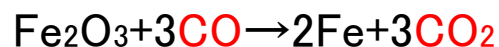


Schematic drawing near the raceway shell

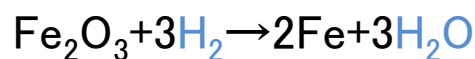
Role of coke in BF

- Heat source (**combustion**)
- Generate reduction gas (**gasification**)
- Carburizing source
- Maintaining **aeration and liquid permeability**

CO₂ gasification



H₂O gasification



Ash particles in coke and pulverized coal

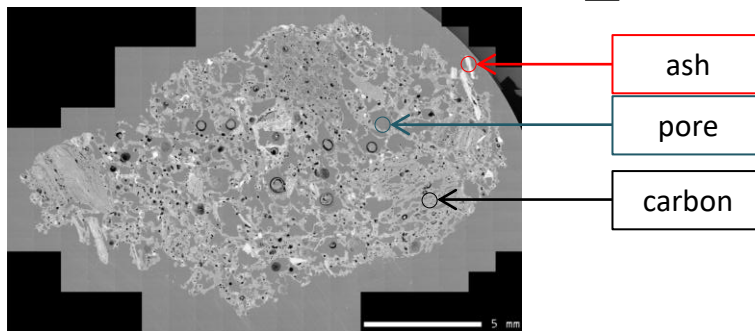
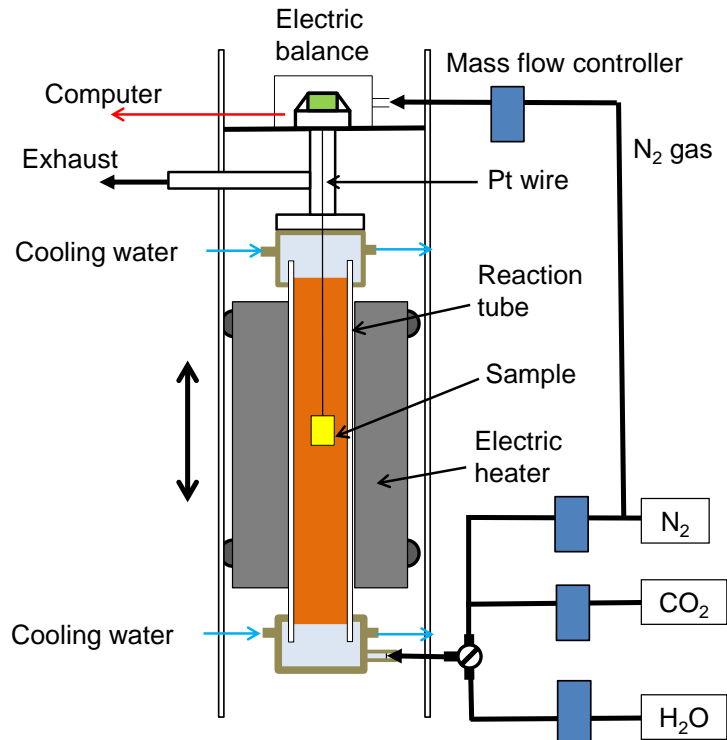
Form **raceway shell**

Breathability of lower part of blast furnace lower

Objective

Elucidation of ash particle behavior in reaction process of coke

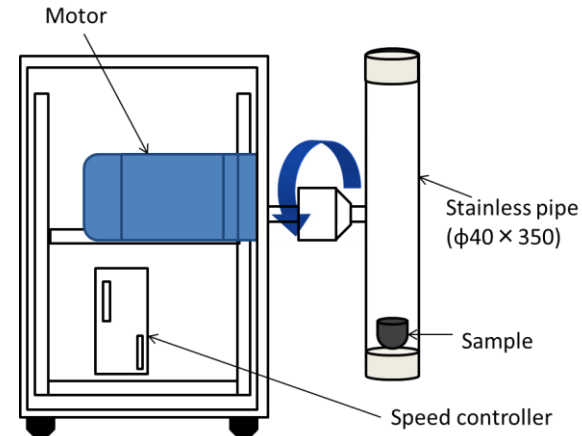
Ash particle behavior in reaction process of coke



SEM image of raw sample

SEM cross-section analysis

- Trivalentization of cross-sectional image
- Area analysis of ash particle, carbon, and pore



Type I tumbler tester

- Take out the sample from the pipe every 5 minutes and sort it into coke lumps (> 1 mm) and powder (≤ 1 mm) with the 1 mm sieve
- Weigh coke lumps and powder
- Return the sample to the pipe and rotate again
- Test time: 25 minutes (5 times)

Research content

- H₂O or CO₂ gasification experiments with single coke particles
- Cross-sectional observation and image analysis of gasification interrupted sample by SEM
- Coke strength test by type I tumbler tester