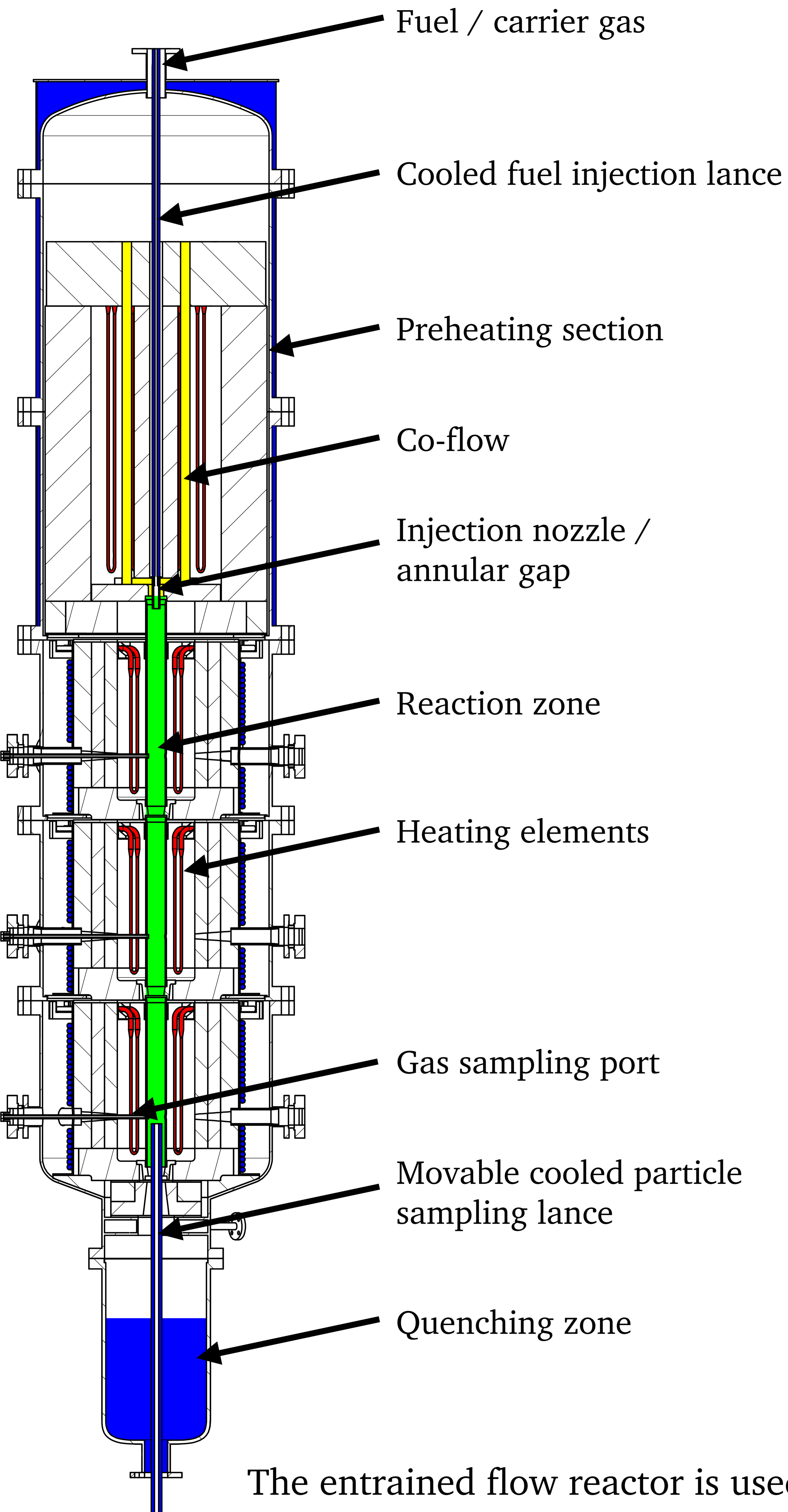


Entrained Flow Reactor PAM

Pressurized and Atmospheric Combustion of Solid Materials



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Entrained Flow Reactor Features

- Total height 6500 mm
- Outer Diameter 900 mm
- Reaction tube: ID 70mm, length 2200mm
- Reactor temperature 900 to 1600 °C
- Reactor pressure: Atmospheric to 20 bar
- Fuel mass flow 50 to 250 g/h
- Gas volume flow 5 m³/h
- Residence time 0.1 to 10 s
- Water-cooled fuel / carrier gas injection
- Preheated co-flow through annular gap
- Gas mixing system: air, N₂, CO₂, O₂
- Particle sampling using movable cooled collection lance
- View ports for gas extraction or optical measurements

The entrained flow reactor is used to study burnout behavior and formation of pollutants during the combustion of solid fuels. The reactor is heated electrically and can be operated in a temperature range from 900 to 1600 °C. The fuel feeding system allows gravimetric particle dosing (coal or biomass) through the water-cooled injection lance. The injection nozzle is located at the bottom part of the preheating section, where the cooled, particle-laden primary gas stream and the heated co-flow enter the reaction zone. The reaction of the solid particles starts at the top of the ceramic reaction tube and proceeds while particles and gas move downwards. A movable, cooled collection lance is used for particle and gas sampling. At three positions, axial ports are available for extractive or in-situ gas phase measurements. Main gas components are analyzed using a continuous ABB gas analyzer (O₂, CO₂, CO, CH₄ and SO₂). Minor species such as H₂S, COS or HCl are analyzed using a GC-MS or MS.