

Experimental unit for catalytic oxidation and adsorption

Description/Parameters

The unit allows testing of catalytic activity in a microreactor with a fixed catalyst bed and determination of sorption capacities of gases and vapours on solid sorbents using simulated waste gas containing up to 5 different components including water vapour and mixtures containing selected VOCs (e.g. benzene, toluene, xylene) dosed using an HPLC pump with subsequent evaporation. The total flow rate for VOC adsorption can be up to 20 l min^{-1} . FTIR (Nicolet) is available for input and output reaction mixture analysis.

Utilization/Services

Testing of laboratory and commercially prepared catalysts (powder, pellets) for VOC catalytic oxidation, NH_3 catalytic oxidation and reduction, to determine activity, selectivity and stability/deactivation.

- Reactions: selective catalytic oxidation of ammonia ($\text{NH}_3\text{-SCO}$), selective catalytic reduction of NO ($\text{NH}_3\text{-SCR}$), VOC catalytic oxidation, VOC adsorption.
- Steady state experiments in the temperature programmed reaction.
- Typical concentration of inlet: NH_3 : 0-550 ppm, NO: 0-500 ppm, O_2 : 0-100 mol. %, water vapour 2 mol. %, N_2 : 0-100 mol. %
- Weight of catalyst: 0.05-0.3 g (0.160-0.315 mm grain size)
- Total volume gas flow: $50 - 200 \text{ ml min}^{-1}$ (20°C , 101 kPa).
- Temperature range: from ambient to 375°C .
- Pressure: atmospheric.

