Claims

1. An apparatus for purifying a process gas (22) containing at least one pollutant gas, with

a reactor vessel which is designed as a centrifugal separator and which has a cylindrical region (5) and a tapering region (9) and into which oxygen or an oxygen-containing gas can be introduced as a reaction gas (21) into at least one gas inlet (1, 2, 3, 12) arranged on the cylindrical region (5) and can be discharged through at least one gas outlet (10, 11) arranged on the tapering region (9), wherein

the at least one gas inlet (1, 2, 3, 12) is arranged and formed to introduce a defined volumetric flow of the reaction gas (21) into the reactor vessel tangentially to a circumferential surface of the cylindrical region (5), and

a pollutant gas inlet (8) which is arranged on the cylindrical region (5) and is designed to introduce a defined volumetric flow of the process gas (22) containing at least one pollutant gas into the reactor vessel, so that

the at least one pollutant gas and the reaction gas (21) are mixed with each other in the direction of the gas outlet (10, 11) and chemically react with each other on their way through the reactor vessel, and

the gas outlet (10, 11) is arranged and designed to discharge process gas that has not undergone chemical reaction and reaction products of the chemical reaction from the reactor vessel, wherein the pollutant gas inlet (8) is arranged on an end face (6) of the cylindrical region (5) of the reactor vessel, wherein the pollutant gas inlet (8) is arranged opposite the gas outlet (10, 11) and is configured to introduce the pollutant gas (22) into the reactor vessel in a rotationally symmetrical manner relative to a longitudinal axis of the gas outlet (10, 11) into the reactor vessel, characterised by a device for adjusting the defined volumetric flow, which is configured to adjust the defined volumetric flow of the process gas (22) containing at least one

pollutant gas and the defined volumetric flow of the reaction gas (21) before introduction into the reactor vessel.

2. The apparatus according to claim 1, characterized in that a temperature sensor (13) is/are arranged on or in the gas outlet (10, 11) and/or a flow velocity sensor is/are arranged in or on the at least gas inlet (1, 2, 3, 12) or the pollutant gas inlet (8).

3. The apparatus according to any one of the preceding claims, characterized in that a heating device is arranged in or on the reactor vessel for supporting the chemical reaction.

4. The apparatus according to any one of the preceding claims, characterized in that the tapering region (9) of the reactor vessel is formed as a conically tapering region.

5. The apparatus according to one of the preceding claims, characterized in that the gas outlet (10, 11) is curved in an arcuate manner, preferably curved by 90°.

6. The apparatus according to any one of the preceding claims, characterized in that a filter element, a scrubber and/or a collecting container for reaction products is removably attachable to the gas outlet (10, 11).

7. A method for purifying a process gas containing at least one pollutant gas, wherein

a defined volumetric flow of oxygen or of an oxygen-containing gas as reaction gas (21) is introduced tangentially to a circumferential surface of the cylindrical region (5) into the reactor vessel via at least one gas inlet (1, 2, 3, 12) arranged on the cylindrical region (5), which reactor vessel is designed as a centrifugal separator and has a cylindrical region (5) and a tapering region (9), and

a defined volumetric flow of the process gas (22) containing the pollutant gas is introduced into the reactor vessel via a pollutant gas inlet (8) arranged on the cylindrical region (5), wherein

the pollutant gas (22) and the reaction gas (21) are mixed with each other, react chemically with each other on their way through the reactor vessel, and process gas not been converted in the chemical reaction and reaction products of the chemical reaction are discharged from the reactor vessel through the gas outlet (10, 11), wherein the pollutant gas inlet (8) is arranged on an end face (6) of the cylindrical region (5) of the reactor vessel and the pollutant gas inlet (8) is arranged opposite the gas outlet (10, 11) and is configured to introduce the pollutant gas (22) into the reactor vessel in a rotationally symmetrical manner relative to a longitudinal axis of the gas outlet (10, 11).