chlorate over a seed crystal of sodium bromate, this provided heteroepitaxial nucleation leading to product crystals of 100% EE of the seed. In this case, fluid flow was the sole generator of secondary nuclei as collisions between seed crystal and crystalliser were non-existent,[194] a new mechanism to that of stirring.

By using seeded and unseeded crystallisation of $NaClO_3$, the exceptions to the work by Kondepudi *et al.* are demonstrated where mixing does not lead to total symmetry breaking, instead reducing the EE towards racemic state.

3.5.3.1 Experimental Setup and Procedure

A stirred tank crystalliser (STC) (Figure 3.16 left) and an oscillatory baffled crystalliser (OBC) (Figure 3.16 right) were used in the investigations. In order to minimize any difference due to crystalliser geometries, two identical glass vessels were used, while the agitator was changed to suit. The glass vessel was 70 mm in diameter and 1000 mL in volume with jacket. The vessel was sealed with a six-neck glass lid, which allows material to be added and extracted from the vessel, the input of the PAT probes, as well as hosting the shaft of the agitator.

For the STC, the vessel was fitted with a 58 mm diameter, PTFE, twin paddle type impeller, with the PAT probes acting as wall baffles to assist the mixing in the system. The surface area of the impeller is 0.041 m^3. For the OBC, a set of 2 PTFE annular orifice baffles were used with outer diameter of 69 mm and orifice diameter of 33 mm. The baffles were spaced at 105 mm apart using stainless steel spacers and oscillated in the fluid by means of a Copley Motion Ltd linear actuator (Model number STA2504S-55-S-S03X) that was controlled by a PC. The surface area of the orifice baffles is 0.061 m^3, about

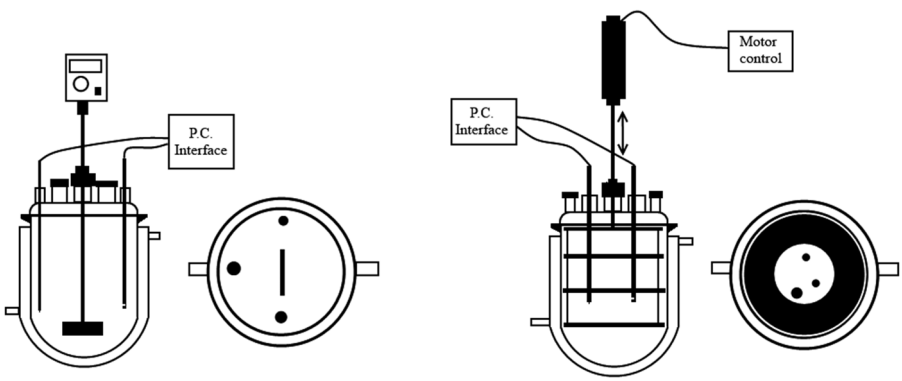

Figure 3.16 The schematics of the STC (left) and the OBC (right). The top view to the right of each system indicates the locations of the FTIR, turbidity and thermocouple[65] with permission from American Chemical Society, Copyright 2012.