

PL01

Optimization and Scale-up of Sonochemical Flow Reactors

Giancarlo Cravotto*, Marina Caporaso, Emanuela Calcio Gaudino, Giorgio Grillo and Zhilin Wu

**Dipartimento di Scienza e Tecnologia del Farmaco, University of Turin, and NIS - Centre for Nanostructured Interfaces and Surfaces, Via P. Giuria 9, I-10125 Turin, Italy.*

giancarlo.cravotto@unito.it

Economics, industrial competitiveness, demand and regulatory constraints have driven the development of greener protocols and the intensification of chemical processes to the point where it has become a key research area. In the last decade several researchers studied the scale-up of sonochemical processes in order to meet industrial needs in terms of volumetric flow rates, reaction energy rates, efficiencies and overall costs. Because the main technical problem to be overcome in industrial sonochemical reactors is related with heat dissipation, the design of flow-through systems was extremely advantageous. We applied sonochemical flow reactors in the treatment of polluted water [1], in biodiesel preparation [2, 3], in oxidative desulfurization/denitrification of liquid fuels [4] and in plant extraction [4] (Fig. 1). Our investigations showed that only accurate experimental trials case by case, enable an optimal set up to be found.

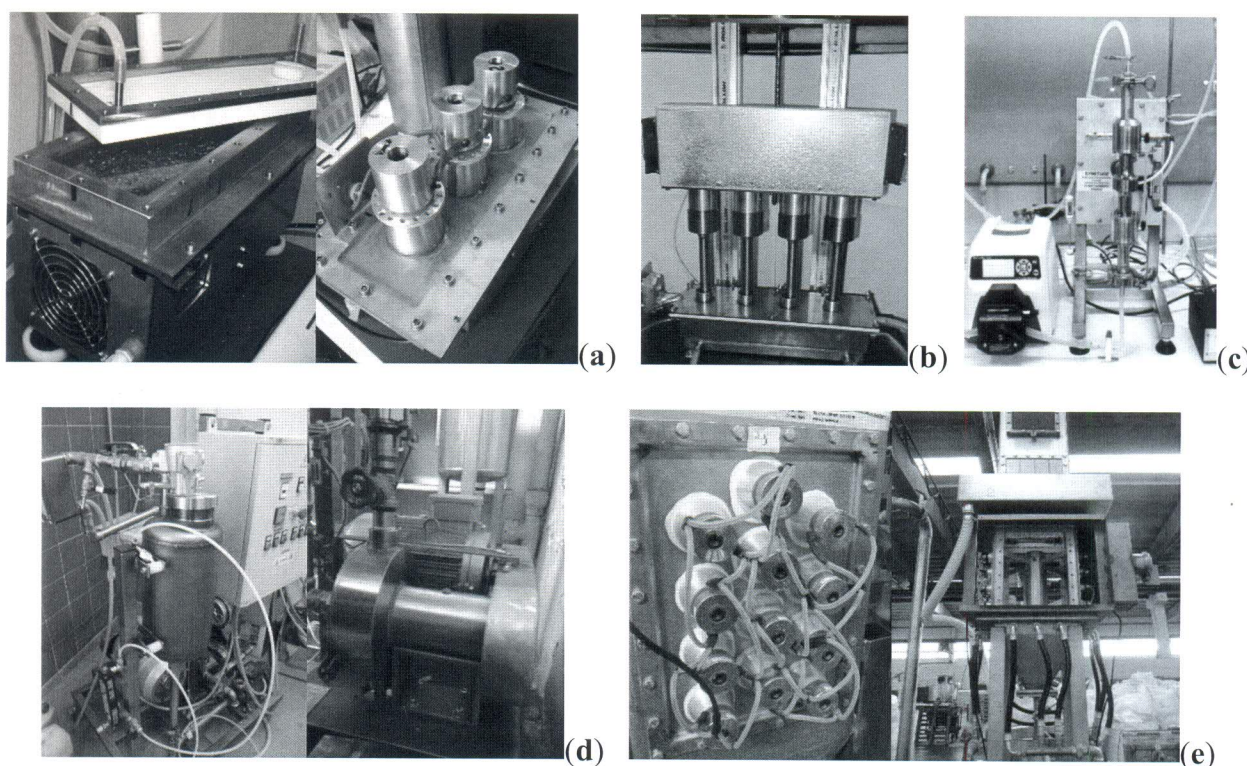


Fig. 1. (a) Multiprobe titanium plate (Danacamerini), (b) Multihorn flow-reactor (Danacamerini), (c) SONITUBE (Synetude), (d) ROTOCAR (EPIC) (e) Industrial multiplate reactor (EPIC)