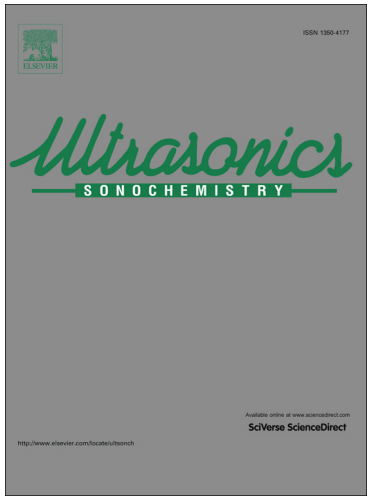

Short communication

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COMMENTS ON THE USE OF LOOP REACTORS IN SONOCHEMICAL PROCESSES

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Abstract

For sonochemical processing on an industrial scale the traditional choice is either a batch or flow system. The former is straightforward in concept but it requires large scale powerful ultrasonic transducers capable of delivering high intensity ultrasound to large volumes of liquid. Unfortunately at the moment the cost and problems involved in building very large sonication devices for batch processes cannot justify the replacement of existing industrial processes. For this reason most sonochemists prefer some form of flow system where small quantities of reagents can be treated as they are pumped from a large vat of reagents through a smaller sonochemical reactor where high intensity ultrasound can be applied. In this short paper we draw attention to a problem which seems common in a number of papers dealing with such flow systems – a confusion between the terms continuous reactor and loop reactor. Further we emphasise the importance of calculating the actual amount of ultrasonic processing experienced by the reaction mixture within the sonication zone of a loop reactor during its operation. The parameters required for such a calculation are: ***ultrasonic processor volume*** (***R_v in L***), ***pump flow rate*** (***F_r in L/min***), ***stock solution volume*** in the reservoir (***S_v in L***) and the overall ***system operating time*** (***S_o in min***).

Introduction

From almost the beginning of the study of what has become known as sonochemistry it has attracted the interest of the chemical industry. This is because sonochemistry offers the real possibility of a technology capable of making reactions more efficient by speeding them up, using less energy and/or providing a higher yield of a target material. It was apparent to researchers however that the scale-up of laboratory reactions for industry could not be achieved simply by moving to large batch reactors. The reason for this was that in order to reproduce the

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