

**Walker, Christoph**

**Coalescence and breakage processes.** (English) Zbl 1074.82534  
*Math. Methods Appl. Sci.* 25, No. 9, 729-748 (2002).

Summary: We extend a model for coalescence and breakage of liquid-liquid dispersions proposed by Fasano/Rosso. The main feature is that the experimentally observed fact of a maximal droplet mass is taken into account. Our model includes spontaneous breakage as well as collisional fragmentation. Existence and uniqueness of solutions is proved and the long-time behaviour is investigated.

**MSC:**

**82C22** Interacting particle systems in time-dependent statistical mechanics  
**45K05** Integro-partial differential equations

Cited in **10** Documents

**Full Text:** [DOI](#)

### References:

- [1] A new model for the dynamics of dispersions in a batch reactor: theory and numerical simulation. In *Lectures on Applied Mathematics: Proceedings of the Symposium on the Occasion of Karl-Heinz Hoffmann's 60th Birthday*, (eds), Munich, June 30-July 1, 1999, Springer: Berlin, Heidelberg, New York, 2000; 123-141. · [doi:10.1007/978-3-642-59709-1\\_10](#)
- [2] Separation of crude oil-water emulsions: experimental techniques and models. Ph.D. Thesis, ETH Zurich, 1998.
- [3] Valentas, *I&E C Fundamentals* 5 pp 271– (1966) · [doi:10.1021/i160018a019](#)
- [4] Valentas, *I&E C Fundamentals* 5 pp 533– (1966) · [doi:10.1021/i160020a018](#)
- [5] Cheng, *Physical Review Letters* 60 pp 2450– (1988) · [doi:10.1103/PhysRevLett.60.2450](#)
- [6] Laurençot, *Journal of Statistical Physics* 104 pp 193– (2001) · [Zbl 1126.82320](#) · [doi:10.1023/A:1010309727754](#)
- [7] *Gewöhnliche Differentialgleichungen* (2. Auflage.). de Gruyter: Berlin, New York, 1995.
- [8] *Functional Analysis and Semigroups*, vol. XXXI (Revised edn.) American Mathematical Society Colloquium Publications: Providence, RI, 1957.
- [9] McGrady, *Physical Review Letters* 58 pp 892– (1987) · [doi:10.1103/PhysRevLett.58.892](#)
- [10] Vigil, *Journal of Colloid and Interface Science* 133 pp 257– (1989) · [doi:10.1016/0021-9797\(89\)90300-7](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.