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Nomenclature Recommendations for Adsorptive Bubble Separation Methods

Barry L. Urger[a]; Robert B. Grieves[b]; Robert Lemlich[c]; Alan J. Rubin[d]; Felix Sebba[e]
[a] Department of Chemistry, Northeastern University, Boston, Massachusetts [b] Department of Civil Engineering, Illinois Institute of Technology, Chicago, lllinois [c] Department of Chemical Engineering, University of Cincinnati, Cincinnati, Ohio [d] Environmental Health Engineering, University of Cincinnati, Cincinnati, Ohio [e] Department of Chemistry including Biochemistry, University of Witwatersrand, Johannesburg, South Africa

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NOTE

Nomenclature Recommendations for Adsorptive Bubble Separation Methods

Recently several separation techniques employing adsorption on bubbles have been introduced. As these methods must be added to the already well-established techniques using this general mechanism for separation, certain confusions have arisen in the literature in regard to the naming of these operations. In this note we should like to recommend nomenclature for these techniques. These recommendations have also been submitted to the I.U.P.A.C. subcommittee on nomenclature in the field of surface activity.

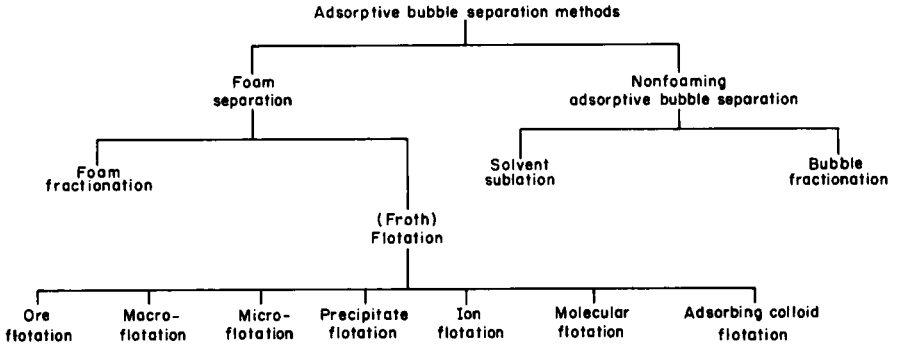

FIG. 1. Schematic representation of nomenclature recommendations.

Figure 1 represents the total nomenclature scheme. As a generic name for the entire subject we propose *adsorptive bubble separation methods* (*1*). This general heading can then be divided into two catagories: *foam separation* and *nonfoaming adsorptive bubble separation*, the distinction being whether the formation of a foam (froth) is required for the separation.

Examination of Fig. 1 reveals the foam separation methods can be further subdivided into two parts:

Foam fractionation (2): The removal of dissolved material by foaming.

Flotation (3): The removal of particulate material by foaming (frothing). (Synonymous with *froth flotation.*)

Flotation presently includes seven subdivisions, not all of which are mutually exclusive:

Ore flotation (3): A special case of froth flotation for the separation of minerals.

Macroflotation: The removal of macroscopic particles by foaming (frothing).

Microflotation (4): The removal of microscopic particles by foaming (frothing), especially microorganisms or colloids. (For the latter, *colloid flotation* may be used.)

Precipitate flotation (5): A special case of froth flotation where a precipitate is removed, the precipitating agent being other than the surfactant.

Ion flotation (6): The removal of a non-surface-active ion by foaming (frothing) through the use of a surfactant which yields an insoluble product, especially if removed as a scum.

Molecular flotation: The removal of a non-surface-active molecule by foaming (frothing) through the use of a surfactant which yields an insoluble product.

Adsorbing colloid flotation (7): The removal of dissolved material by adsorption on colloidal particles followed by removal of such particles by flotation.

Nonfoaming adsorptive bubble separations presently include two subdivisions:

Bubble fractionation (8): The removal of material (whether molecular in size or particulate) by virture of adsorption at the surface of rising

bubbles followed by redeposition at or just under the main surface of the liquid pool.

Solvent sublation (9): The removal of material (whether molecular in size or particulate) by virture of adsorption at the surface of rising bubbles followed by deposition within, or at either horizontal interface of, an immiscible liquid atop the main liquid.

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BARRY L. KARGER

Department of Chemistry,
Northeastern University,
Boston, Massachusetts

ROBERT B. GRIEVES

Department of Civil Engineering,
Illinois Institute of Technology,
Chicago, Illinois

ROBERT LEMLICH

Department of Chemical Engineering,
University of Cincinnati,
Cincinnati, Ohio

ALAN J. RUBIN

Environmental Health Engineering,
University of Cincinnati,
Cincinnati, Ohio

FELIX SEBBA

Department of Chemistry including Biochemistry,
University of Witwatersrand,
Johannesburg, South Africa

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