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Eberl et al.

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(54) **CRYSTALLIZATION OF POWDERS HAVING UNIFORM PARTICLE SIZES BY OSTWALD RIPENING AT LARGE LEVELS OF SUPERSATURATION**

4,067,739 A	*	1/1978	Lewis	118/19
5,239,805 A	*	8/1993	Saitou	430/569
5,254,453 A	*	10/1993	Chang	430/569
5,716,419 A	*	2/1998	Larsen	23/300
5,807,665 A	*	9/1998	Saitou	430/569

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\* cited by examiner

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(57) **ABSTRACT**

A method is provided for the manufacture of mineral power crystals having a uniform mean size. The method includes forming a solution which is highly supersaturated with respect to the crystals. The crystals of the solution are Ostwald ripened at a level of supersaturation that produces an Ostwald steady state crystal size distribution shape wherein the crystals are of a uniform size. After Ostwald ripening ceases, the crystals further grow by supply controlled growth which uniformly increases the size thereof. This enables the supply controlled growth to be terminated at a selected, controlled point so as to produce a desired mean crystal size.

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(58) Field of Search ..... 117/11, 50, 51, 117/53

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,900,292 A \* 8/1975 Fairchild ..... 23/273

4 Claims, 1 Drawing Sheet

