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[54] **SLOW-RELEASE COMPOSITE AND PROCESS FOR PRODUCING THE SAME**

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[58] **Field of Search** 514/15, 965; 424/81, 424/19, 20, 21, 22, 33

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,003,846	1/1977	Kuhn et al.	514/963
4,007,258	2/1977	Cohen et al.	514/965
4,263,282	4/1981	von der Ohe et al.	514/15
4,269,821	5/1981	Kreuter et al.	424/33
4,321,117	3/1982	Kaetsu et al.	424/33
4,351,829	9/1982	Zetler et al.	514/15
4,359,483	11/1982	Kaetsu et al.	424/33
4,452,775	6/1984	Kent	424/19
4,497,801	2/1985	Hashimoto et al.	514/15
4,518,547	5/1985	Cuff et al.	424/32
4,554,156	11/1985	Fischer et al.	424/81

FOREIGN PATENT DOCUMENTS

EP52510	5/1982	European Pat. Off.	514/15

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[57] **ABSTRACT**

A slow-release composite having pyroglutamyl-histidyl-triptophyl-seryl-tyrosyl-D-leucyl-leucyl-arginyl-proline ethylamide or a salt thereof encapsulated in a polymer matrix and a process the same are herein disclosed.

10 Claims, 7 Drawing Figures