



US006120787A

United States Patent [19]

Gustafsson et al.

[11] Patent Number: **6,120,787**[45] Date of Patent: **Sep. 19, 2000**[54] **SUSTAINED RELEASE PARTICLES**

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[73] Assignee: **Biogram AB**, Malmö, Sweden[21] Appl. No.: **09/051,709**[22] PCT Filed: **Sep. 3, 1996**[86] PCT No.: **PCT/SE96/01091**§ 371 Date: **Apr. 17, 1998**§ 102(e) Date: **Apr. 17, 1998**[87] PCT Pub. No.: **WO97/14408**PCT Pub. Date: **Apr. 24, 1997**[30] **Foreign Application Priority Data**

Oct. 19, 1995 [SE] Sweden 9503672

[51] Int. Cl.⁷ **A61F 2/00**[52] U.S. Cl. **424/426; 424/489; 424/497;**
424/486; 424/461; 424/468; 424/426; 424/490[58] Field of Search **424/426, 489,**
424/490, 491, 488, 402.21, 484, 485, 486[56] **References Cited****U.S. PATENT DOCUMENTS**

4,384,975 5/1983 Fong .
 4,479,911 10/1984 Fong .
 4,568,559 2/1986 Nuwayser et al. .

4,623,588 11/1986 Nuwayser et al. .
 4,637,905 1/1987 Gardner .
 4,666,704 5/1987 Shalati et al. .
 4,677,191 6/1987 Tanaka et al. .
 4,822,535 4/1989 Ekman et al. .
 4,835,139 5/1989 Tice et al. .
 4,849,228 7/1989 Yamamoto et al. .
 5,275,819 1/1994 Amer et al. .
 5,288,502 2/1994 Mc Ginity et al. 424/484
 5,417,982 5/1995 Modi .
 5,679,377 10/1997 Bernstein et al. 424/491

FOREIGN PATENT DOCUMENTS

0535937 A1 4/1993 European Pat. Off. .
 88/07870 10/1988 WIPO .
 90/13780 11/1990 WIPO .
 94/12158 6/1994 WIPO .

Primary Examiner—Thurman K. Page*Assistant Examiner*—William E. Benston, Jr.*Attorney, Agent, or Firm*—Burns, Doane, Swecker &
 Mathis, L.L.P.[57] **ABSTRACT**

A method of preparing parenterally administrable sustained release microparticles, which comprises preparing core particles in an aqueous medium that is essentially free from organic solvent, a biologically active substance being entrapped therein during or after said preparation, drying the core particles and coating the same with a release-controlling polymer by air suspension technique so as to create a shell on the core particles without any detrimental exposure of the active substance to organic solvent. Microparticles obtainable by such a method also are provided.

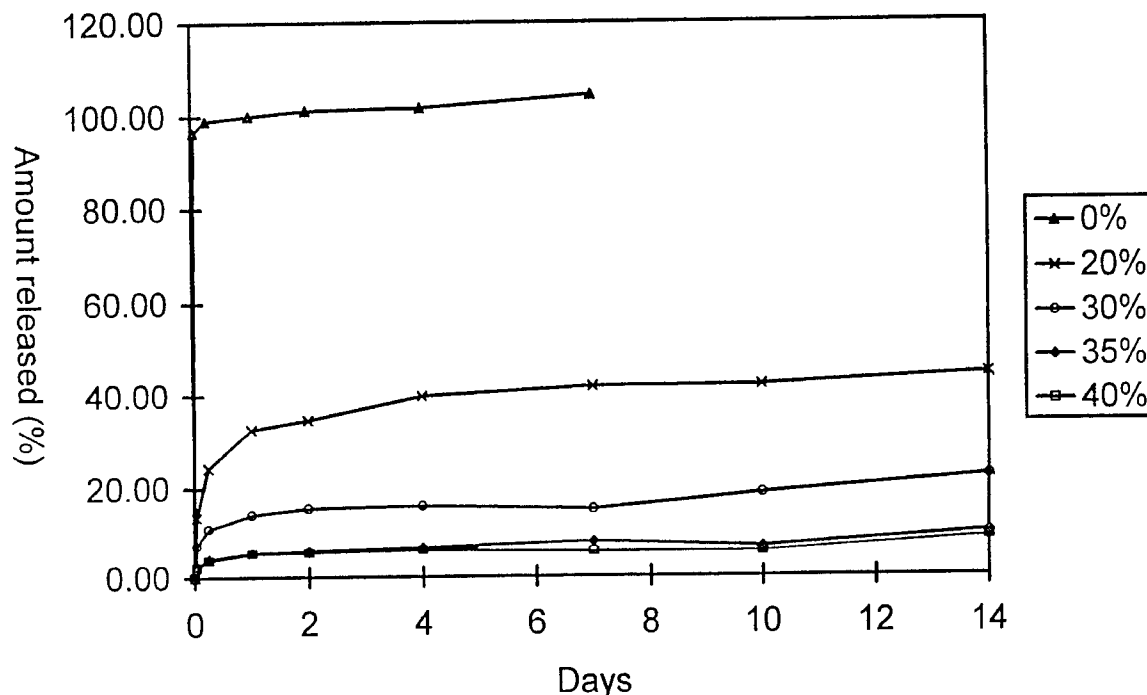
32 Claims, 5 Drawing Sheets

Fig. 1

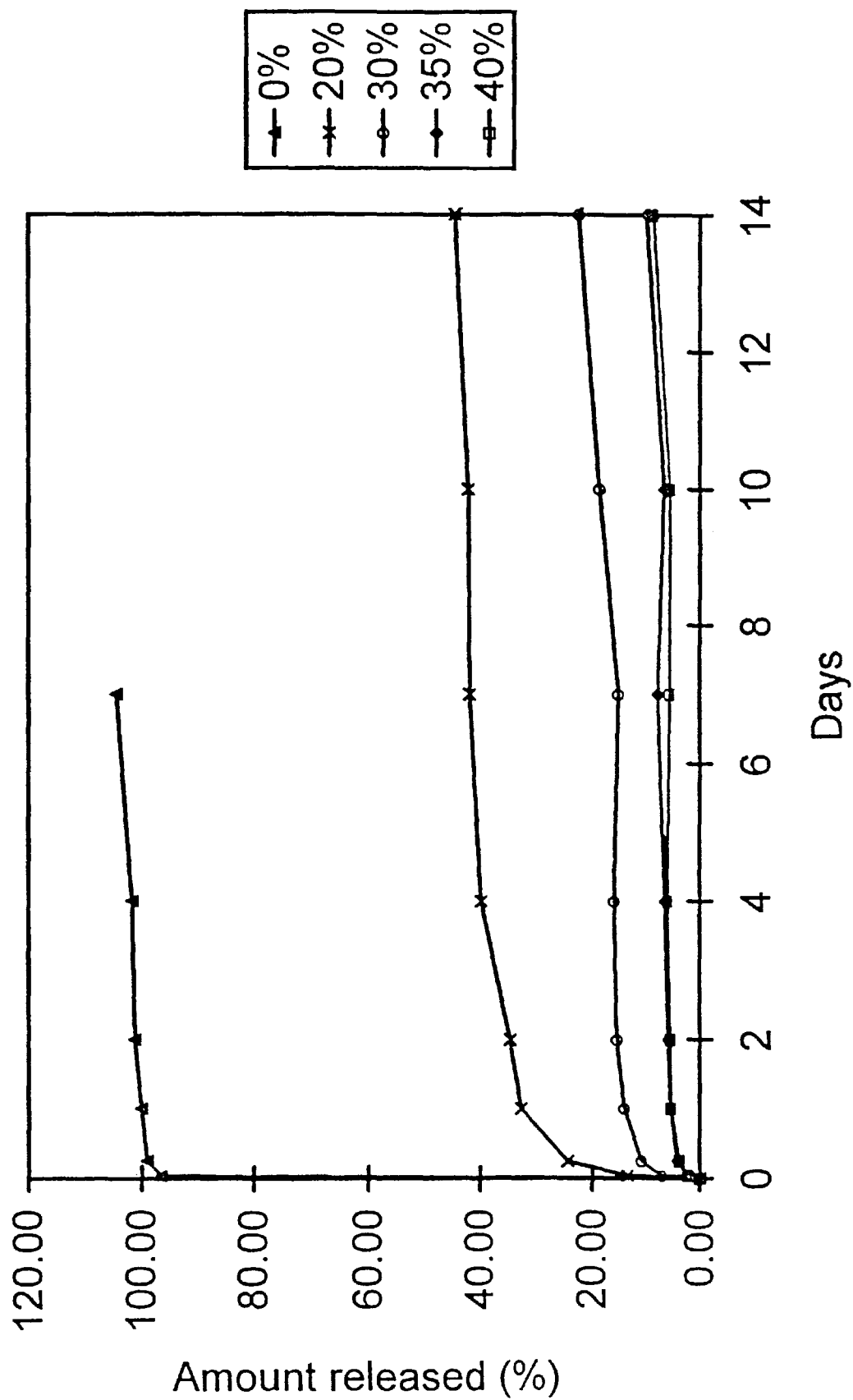


Fig. 2

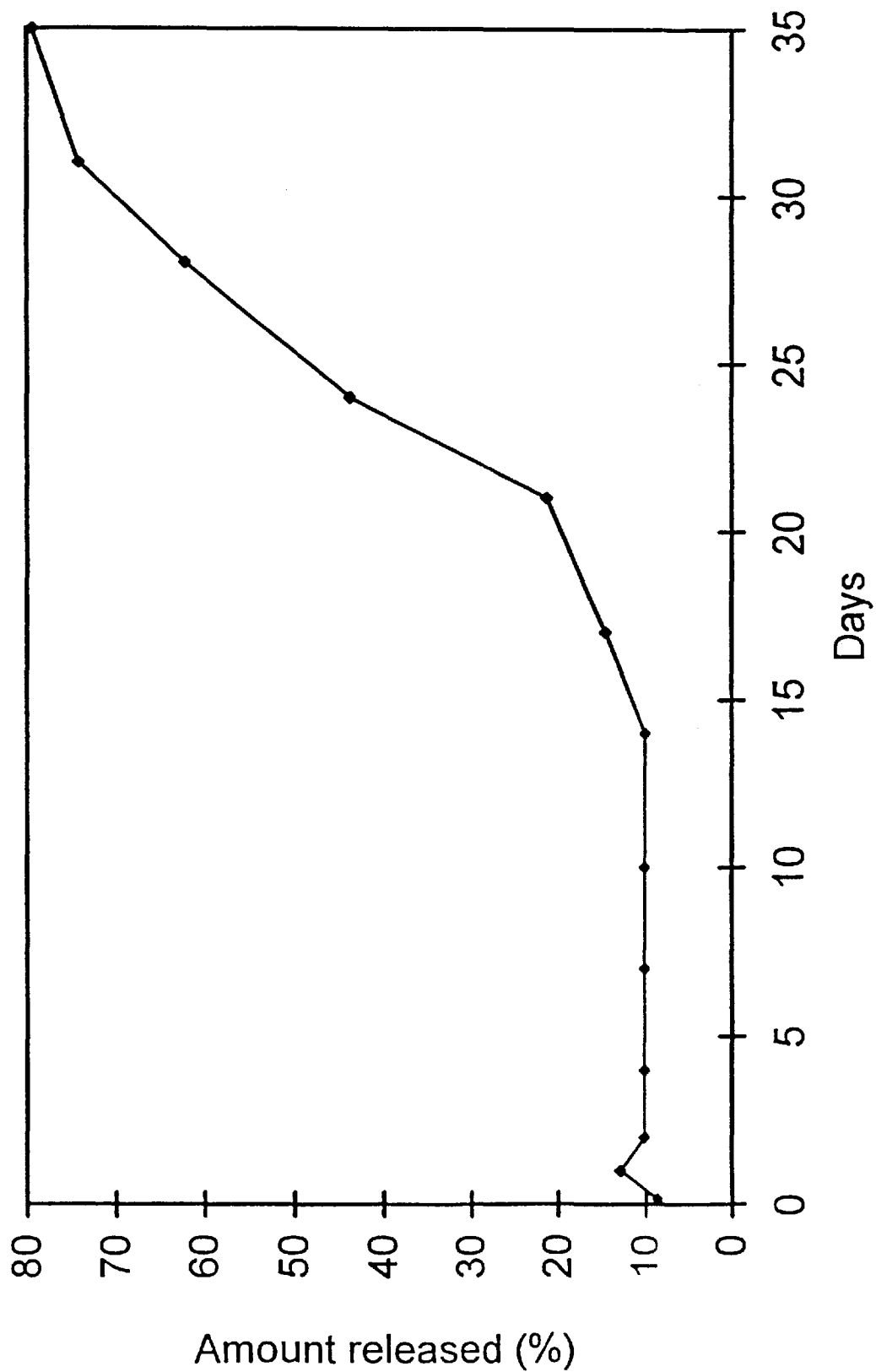


Fig. 3

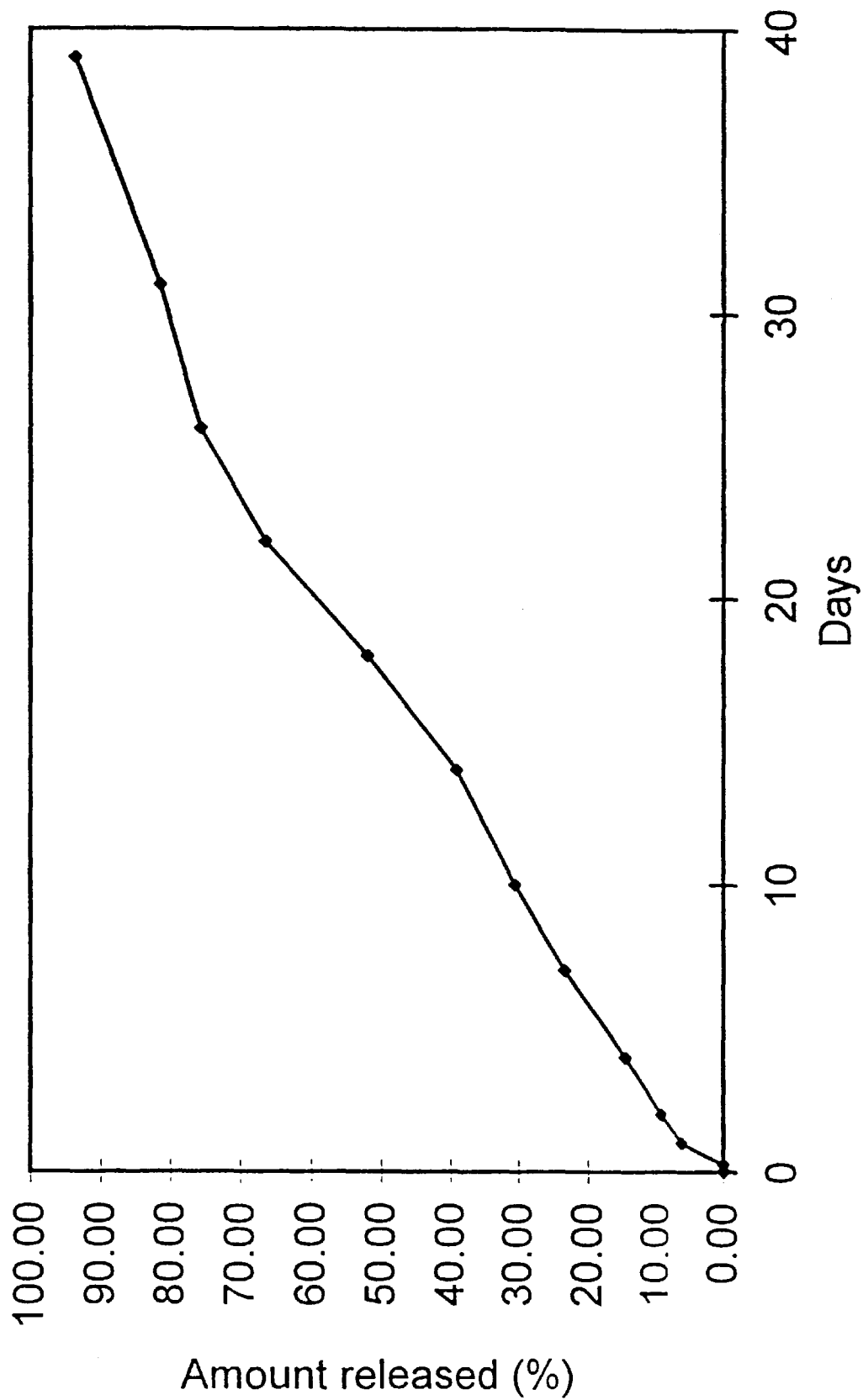
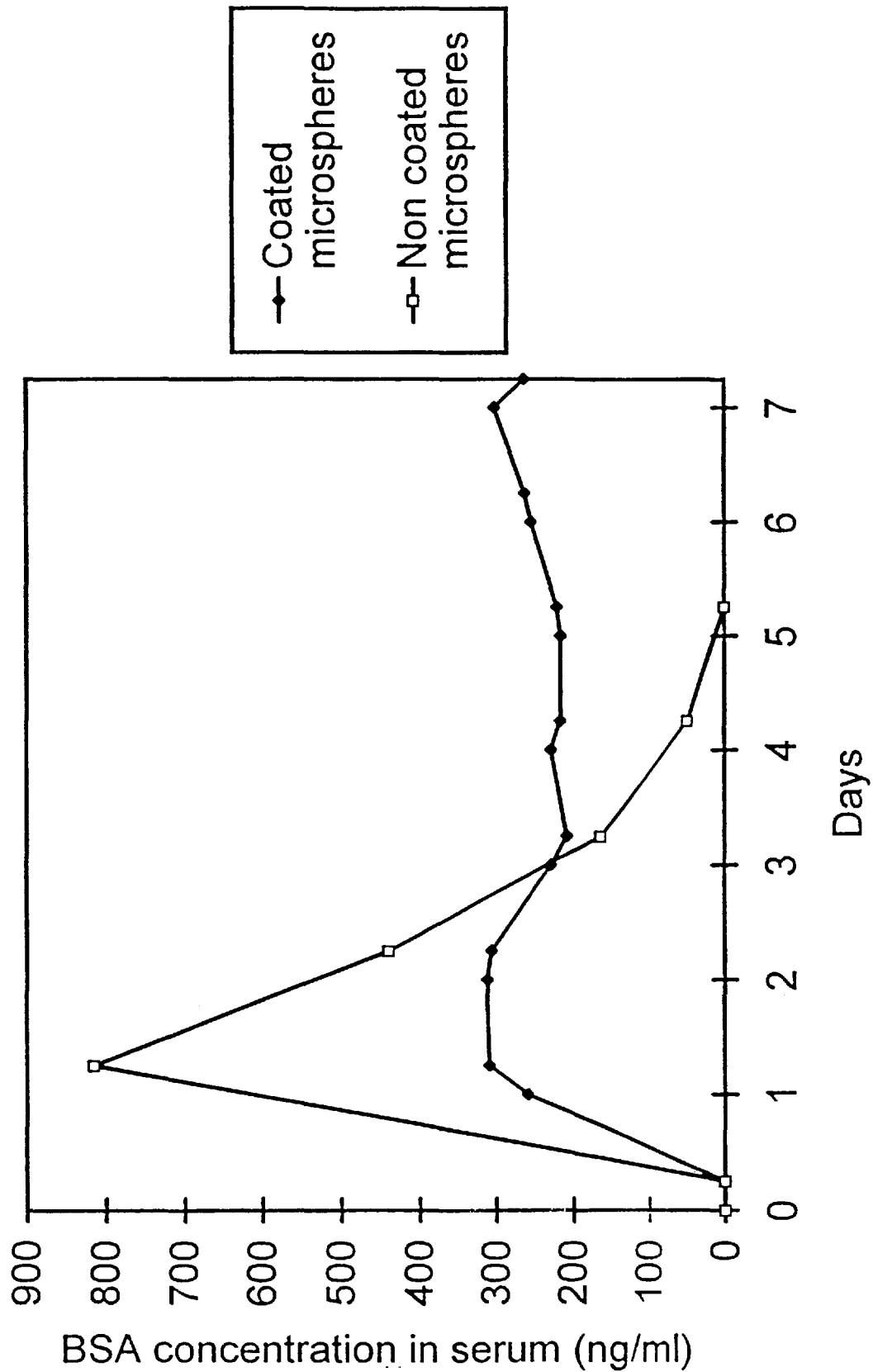


Fig. 4





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