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Nuwayser

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- (54) **MULTI-LAYERED MICROCAPSULES AND METHOD OF PREPARING SAME**
- (75) Inventor: **Elie S. Nuwayser**, Woburn, MA (US)
- (73) Assignee: **Biotek, Inc.**, Woburn, MA (US)
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- (51) **Int. Cl.**
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- (52) **U.S. Cl.** **424/490**; 424/489; 424/497; 424/452; 424/463
- (58) **Field of Classification Search** 424/451, 424/452, 455, 463, 458
See application file for complete search history.

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Primary Examiner—Lakshmi Channavajjala
(74) *Attorney, Agent, or Firm*—Banner & Witcoff, Ltd.

(57) **ABSTRACT**

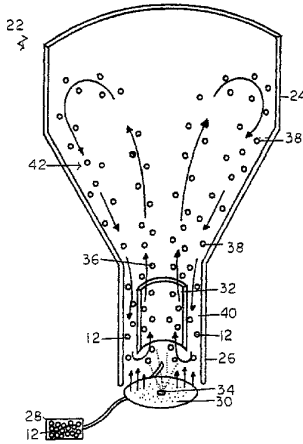
A multi-layered microcapsule containing one or more active ingredients and process for preparing the same is disclosed. The multi-layered microcapsule comprises an inner solid microparticle core, typically composed of a biodegradable polymer, and having one or more alternating layers of polymer, active ingredient or polymer/active ingredient mixtures to produce a multi-layered microcapsule wherein the polymer or active ingredient in each layer may be the same or different or have the same or different concentration of the polymer or active ingredient in other layers.

32 Claims, 9 Drawing Sheets

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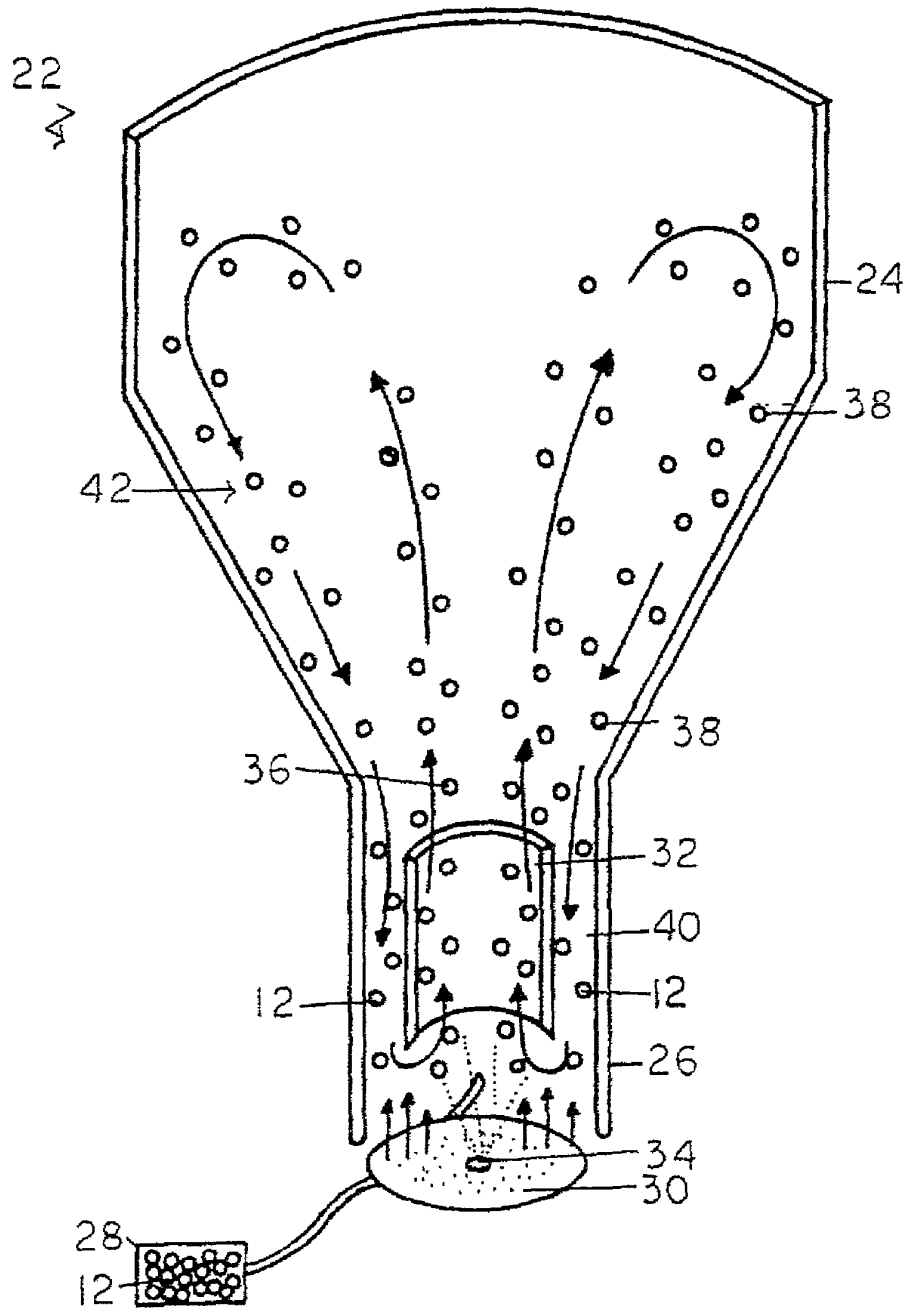


Figure 1

Figure 2. Plasma Level of Beta-Estradiol from Estrel™
Microcapsules in Five Women

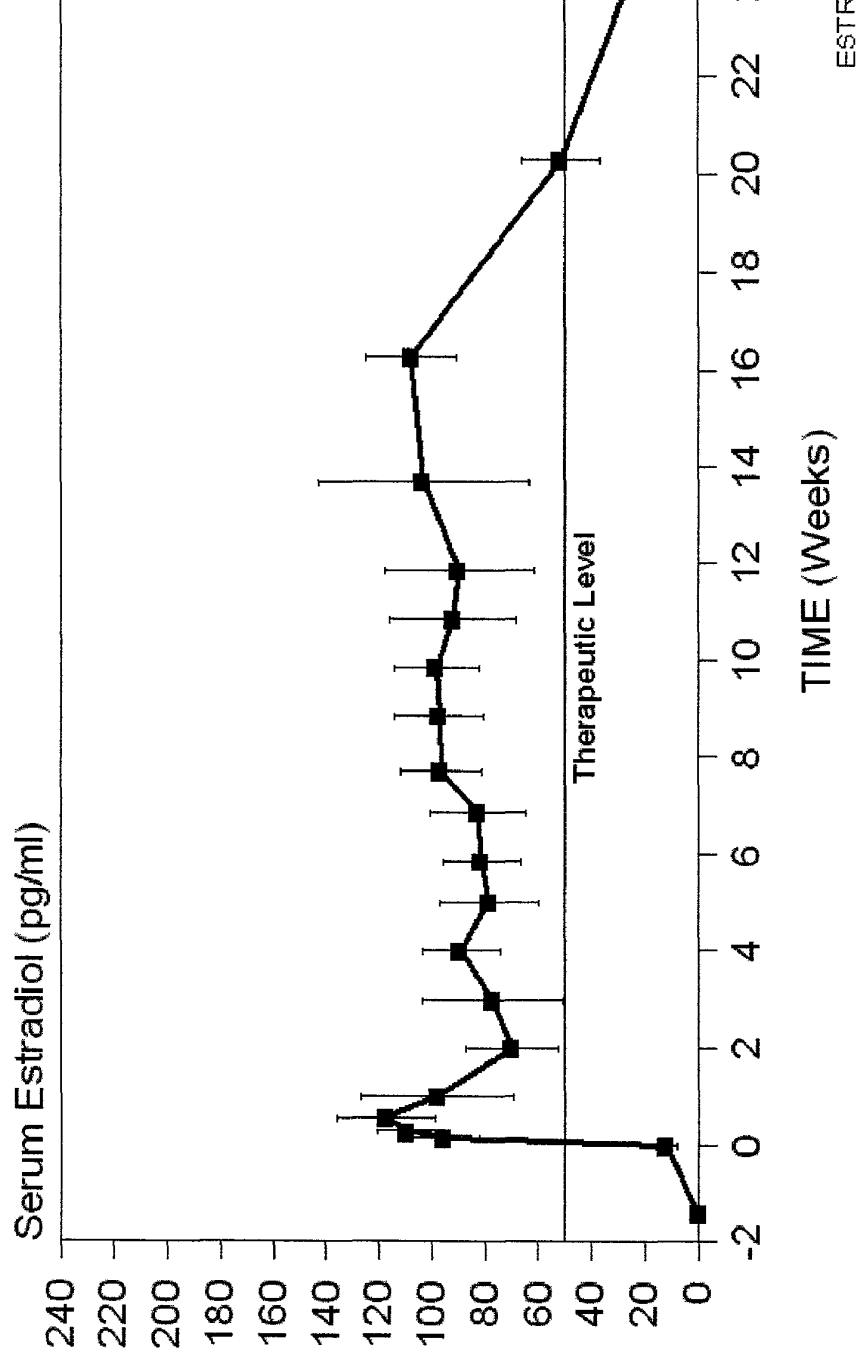
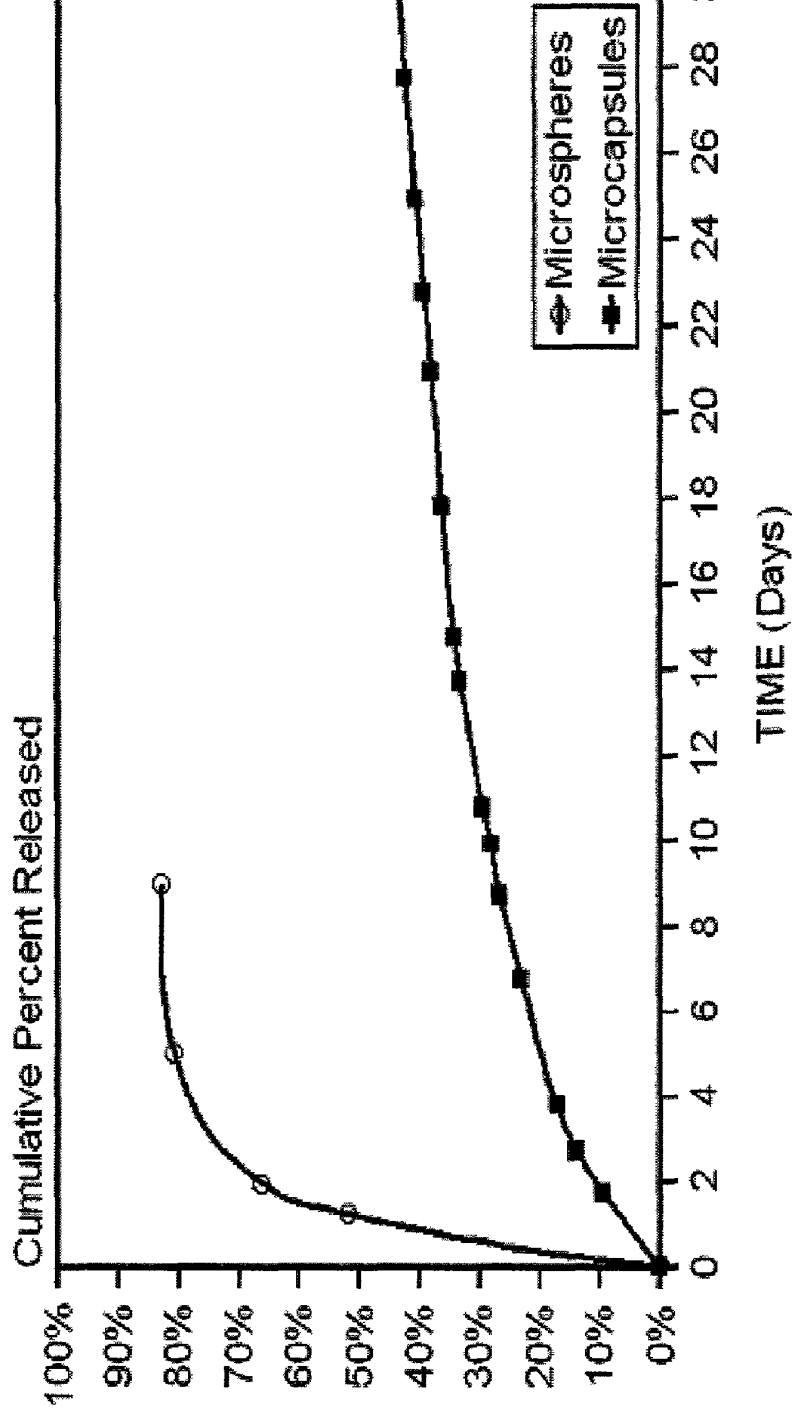


Figure 3. In Vitro Release of Testosterone from Microspheres and Microcapsules (n=3)



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