



US005690840A

United States Patent [19]

[11] Patent Number: **5,690,840**

Antonucci et al.

[45] Date of Patent: **Nov. 25, 1997**

[54] **METHOD AND COMPOSITION FOR PROMOTING IMPROVED ADHESION TO SUBSTRATES**

Attorney, Agent, or Firm—Leydig, Voit & Mayer, Ltd

[57] **ABSTRACT**

[75] Inventors: **Joseph M. Antonucci**, Kensington;
Patricia A. Bennett, Germantown, both of Md.

An etchant primer composition is provided which includes (a) a compound having the formula



[73] Assignee: **The United States of America as represented by the Secretary of Commerce**, Washington, D.C.

wherein

R=R¹ or R²;

R¹=an aromatic group;

R²=a conjugated aliphatic group;

[21] Appl. No.: **562,903**

Y=a single bond, CH₂, CHCH₃ or C=CH₂; and each M is independently H, an alkali metal, an alkaline earth metal, aluminum, a transition or redox metal or an alkyl group having 1 to 18 carbon atoms, with the proviso that when both M groups are alkyl groups, the compound corresponding to formula I be capable of being easily hydrolyzed, displaced or exchanged with other reagents present in the etchant/primer composition and (b) a polar solvent system. An etchant/primer/adhesive monomer composition is also provided which includes the etchant/primer composition and an adhesive monomer system. One and two step simplified methods for adhering and for preparing a substrate surface, such as a dental substrate surface, to a polymeric material are also provided. Kits which may be used with these compositions and methods are also provided.

[22] Filed: **Nov. 27, 1995**

Related U.S. Application Data

[62] Division of Ser. No. 189,709, Feb. 1, 1994, Pat. No. 5,498,643.

[51] Int. Cl.⁶ **A61K 6/08**

[52] U.S. Cl. **216/34; 216/83; 252/79.1**

[58] Field of Search **216/34, 83, 96; 252/79.1; 427/307, 308, 309**

[56] References Cited

U.S. PATENT DOCUMENTS

5,320,886 6/1994 Bowen 428/34.1

Primary Examiner—Thi Dang

19 Claims, 3 Drawing Sheets