



US006368773B1

(12) **United States Patent**
Jung et al.(10) **Patent No.: US 6,368,773 B1**
(45) **Date of Patent: Apr. 9, 2002**(54) **PHOTORESIST CROSS-LINKER AND
PHOTORESIST COMPOSITION
COMPRISING THE SAME**(75) Inventors: **Jae Chang Jung; Keun Kyu Kong;
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Ltd.** (KR)(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.(21) Appl. No.: **09/448,916**(22) Filed: **Nov. 24, 1999**(30) **Foreign Application Priority Data**Nov. 27, 1998 (KR) 98-51355
Feb. 22, 1999 (KR) 99-5823(51) **Int. Cl.⁷** **G03F 7/027**(52) **U.S. Cl.** **430/281.1; 430/270.1;
430/325**(58) **Field of Search** 430/270.1, 281.1,
430/325; 526/271, 317.1, 333; 568/594,
596(56) **References Cited****U.S. PATENT DOCUMENTS**

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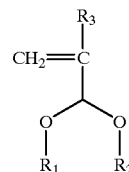
Chemical Abstract No. 110:96578.

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Primary Examiner—Rosemary Ashton(74) *Attorney, Agent, or Firm*—Townsend and Townsend
and Crew LLP(57) **ABSTRACT**

The present invention relates to a cross-linker for photoresist compositions which is suitable for a photolithography process using KrF (248 nm), ArF (193 nm), E-beam, ion beam or EUV light sources. Preferred cross-linkers, according to the present invention, comprise a copolymer of (i) a compound represented by following Chemical Formula 1 and/or (ii) one or more compound(s) selected from the group consisting of acrylic acid, methacrylic acid and maleic anhydride.

<Chemical Formula 1>



wherein, R₁ and R₂ individually represent straight or branched C₁₋₁₀ alkyl, straight or branched C₁₋₁₀ ester, straight or branched C₁₋₁₀ ketone, straight or branched C₁₋₁₀ carboxylic acid, straight or branched C₁₋₁₀ acetal, straight or branched C₁₋₁₀ alkyl including at least one hydroxyl group, straight or branched C₁₋₁₀ ester including at least one hydroxyl group, straight or branched C₁₋₁₀ ketone including at least one hydroxyl group, straight or branched C₁₋₁₀ carboxylic acid including at least one hydroxyl group, and straight or branched C₁₋₁₀ acetal including at least one hydroxyl group; and R₃ represents hydrogen or methyl.

10 Claims, 12 Drawing Sheets