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# United States Patent [19]

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**Bowen**

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[54] **HYDROPHILIC CROSSLINKING MONOMERS AND POLYMERS MADE THEREFROM**

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[51] Int. Cl.<sup>5</sup> ..... **B29D 22/00; A61K 6/08; C08G 69/00**

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[58] Field of Search ..... **428/34.1; 525/42, 43; 528/126, 127, 173, 179, 182, 185, 188, 205, 222, 223, 224, 332, 336, 337, 344, 345; 523/116**

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[57] **ABSTRACT**

This invention relates primarily to organofunctional monomers, predominantly dimethacrylates and/or diacrylates containing one or more (predominantly two carboxyl groups, with moieties that provide sufficient affinity with water to allow any desired amount of water and/or miscible fugitive solvents to be mixed homogeneously with these monomers and formulations containing them. The activity of water in the monomer formulations can be adjusted so that it is equal to the water activity in biological tissues. This promotes biocompatibility and enhances the adhesive characteristics of polymers prepared from these formulations. Probability statistics are disclosed that optimize the compositions of polymer reaction products. Also disclosed are novel, dual-purpose synthesis reaction monomers, catalysts, stabilizers, polymerization initiators and/or copolymerization initiators that have solubility and surface-activity characteristics such that they will not become separated by partitioning during penetration of hydrated layers on or in the substrate adherends. These formulations may be used for light-cured or chemical-cured bonding to soft or hard tissues, metal, porcelain, ceramic or other surfaces. A potential application for the composition is the holding together, by an overlying layer of resulting polymer, tissues adjacent to incisions and wounds. The polymerized composition might replace suturing, and allow for the healing of soft tissues.

**57 Claims, No Drawings**