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(54) **MACROMOLECULAR COMPOUNDS**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

4,536,265 A		8/1985	Fabrizio et al.	
4,872,877 A		10/1989	Tiffany	
5,539,074 A		7/1996	Herr et al.	
5,661,195 A		8/1997	Christ et al.	
5,767,169 A		6/1998	Leppard et al.	
5,821,306 A	*	10/1998	Hodd	525/228
6,087,412 A	*	7/2000	Chabrecek et al.	522/35
6,096,369 A		8/2000	Anders et al.	
6,367,929 B1	*	4/2002	Maiden et al.	351/160 H
6,399,734 B1	*	6/2002	Hodd et al.	528/32
6,589,550 B1	*	7/2003	Hodd et al.	424/429
6,613,343 B2	*	9/2003	Dillingham et al.	424/427

FOREIGN PATENT DOCUMENTS

DE	1795565	5/1964
EP	0611786	8/1994
EP	0800657	11/1998
EP	0887369	12/1998
JP	8-231564	9/1996
WO	WO9207885	5/1992
WO	WO9209644	6/1992
WO	WO9621167	7/1996
WO	WO9631547	10/1996
WO	WO9908135	2/1999
WO	WO9908136	2/1999

OTHER PUBLICATIONS

Angiolini et al, *Journal of Applied Polymer Science*, 51(1):133–143 (1994).

* cited by examiner

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(57) **ABSTRACT**

Macromolecular photocrosslinkers have polymeric backbones of substituted siloxane groups carrying photoactive groups. When exposed to light of wavelength above 305 nm, the photocrosslinkers are adapted to generate radicals which are retained on the macromolecular photocrosslinker and react to form a crosslinked network structure. The photocrosslinkers may be used in the production of medical devices, including ophthalmic lenses.

28 Claims, No Drawings