

**A POLYMERIC SUBSTRATE CONTAINING
POLYMERIC MICROELEMENTS AND
METHODS OF MAKING AND USING THE SAME**

Abstract of the Disclosure

5 The present invention relates to an
article of manufacture or polishing pad for
altering a surface of a workpiece, such as
polishing or planarizing a semiconductor device.
The article includes a polymeric matrix impregnated
10 with a plurality of polymeric microelements, each
polymeric microelement having a void space therein.
The article has a work surface and a subsurface
proximate to the work surface. When the article is
in contact with a working environment, polymeric
15 microelements at the work surface of the article
are less rigid than polymeric elements embedded in
the subsurface. As the work surface of the article
is abraded during use, the work surface of the pad
may be continuously regenerated. In alternative
20 preferred embodiments, the work surface may further
include a minitexture and/or a macrotexture.
Preferably, the minitexture is formed by fractal
patterning at least a portion of the work surface.
The present invention also includes methods for
25 decreasing the effective rigidity of polymeric
microelements at the work surface of the article,
regenerating the work surface of the article and
planarizing a surface of a semiconductor device
utilizing the article.