

Surface Behavior of Blends of SBR with Ultrasonically Devulcanized Silicone Rubber

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ABSTRACT: The application of silicone polymers as additives in commercial polymers for improving their surface properties is an attractive method. Use of reclaimed silicone rubber for blending with commercial organic polymers is an equally attractive possibility. Ultrasonically devulcanized silicone rubber was mixed with virgin and ultrasonically devulcanized styrene–butadiene rubber (SBR). The surface and bulk mechanical properties and curing behavior of the blends of SBR with ultrasonically devulcanized silicone rubber were investigated. Contact angles of these blends were measured, and the concentration of silicone rubber on the surface was calculated. It was shown that the soluble part of devulcanized silicone rubber migrates to the surface. The addition of 5 phr of devulcanized silicone rubber led to the formation of a continuous surface layer containing 100% silicone rubber. In general, the mechanical properties of the blends remain intact and, in some cases, are even better than those of SBR. Curing behavior shows that the blends have the similar cure kinetics as virgin or devulcanized SBR, but a lower final torque. © 1998 John Wiley & Sons, Inc. *J Appl Polym Sci* 69: 2691–2696, 1998

Key words: silicone; silicone rubber; PDMS; SBR; ultrasound; devulcanization; re-vulcanization; gel; sol; blends; surface properties; surface concentration; contact angle; cure behavior; mechanical properties