

## عنوان مقاله:

Effect of hydroxyl terminated polybutadiene number-averaged molecular weight on chemorheological behavior of polyurethane networking

## محل انتشار:

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## خلاصه مقاله:

The time available for proper casting of the polyurethane (PU) system after isocyanate addition (called pot life) affects the macrodiol microstructure. In this research, the effect of molecular weight ( $M_n$ ) of hydroxyl terminated polybutadiene (HTPB) as an important macrodiol on the pot life of polyurethane system was rheologically investigated. The chemorheological behavior of polyurethane systems based on five different HTPBs with  $M_n$  ranging from ۲۸۱۰ to ۴۴۵۰ g/mol and two common diisocyanates (TDI and IPDI) were studied in situ. The results showed that by increasing  $M_n$ , the rotational viscosity as well as the constant reaction rate of urethane formation increases; whereas the pot life of the polyurethane system decreases. The pseudoplastic behavior of the samples showed the minimum rate constant/longest pot life at a critical molecular weight ( $M_c$ ) of about ۳۱۰۰ g/mol, which may be due to physical chain entanglements. Rheomechanical spectrometry interestingly depicted that  $\tan \delta$  originated-gel point occurs before the intersection of stored modulus ( $G'$ ) and loss modulus ( $G''$ ) ( $t_{gel} < t_{G'=G''}$ ). The kinetic model developed by Hsieh showed excellent agreement with the cross-linking data of three polyurethane systems.

## کلمات کلیدی:

HTPB, number-averaged molecular weight, pot life, Gel Time, Dynamic Rheological, polyurethane system

## لینک ثابت مقاله در پایگاه سیویلیکا:

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