

Universidade de São Paulo Instituto de Física de São Carlos

Semana Integrada do Instituto de Física de São Carlos

13ª edição

Livro de Resumos

São Carlos
2023

Ficha catalográfica elaborada pelo Serviço de Informação do IFSC

Semana Integrada do Instituto de Física de São Carlos
(13: 21-25 ago.: 2023: São Carlos, SP.)

Livro de resumos da XIII Semana Integrada do Instituto de Física de São Carlos – Universidade de São Paulo / Organizado por Adonai Hilário da Silva [et al.]. São Carlos: IFSC, 2023.
358p.

Texto em português.

1.Física. I. Silva, Adonai Hilário da, org. II. Título.

ISSN: 2965-7679

IC35

Probing mobility constrains in polymers using ^1H double quantum time domain NMR as a method to investigate thermal, chemical or environmental degradation effects

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We will discuss the application of ^1H double quantum time domain NMR (^1H DQTDNMR) to probe distribution of mobility constraints resulting from degradation of polymers. ^1H DQTDNMR allows detecting the build-up of double quantum coherences, which can be associated to the density of points with some movement restriction in the sample. Applying this technic at temperatures where a solid phase is absent, the double quantum coherences can be associated to chain crosslinking or entanglement. (1) We will discuss the most common processing procedures, the limitations and advantages of the method considering the different polymer systems, for example elastomers, polymer melts and polymer composites. Finally, we will show examples on how this type of method can help to characterize the degradation process in constructing polymer such as polyamides. Acknowledgements: PETROBRAS, CNPQ (grant 308760/2022-0) and FAPESP.

Palavras-chave: Double quantum. Polymer. Crosslinks.

Agência de fomento: PUB-USP (Não se aplica)

Referências:

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