

# Nanogels and Nanofibers of modified Polypropylene by gamma irradiation

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The objective of this work is the investigation of the nanogel and nanofibers formation in modified polypropylene (PP). The modified PP in pellets was synthesized by gamma irradiation of pristine PP under a crosslinking atmosphere of acetylene in dose of 12.5 kGy, followed by thermal treatment for radical recombination and annihilation of the remaining radicals [1]. The thin film gel of the polypropylenes was obtained by extraction in boiling xylene for period of 12 hours at 138 °C, followed by decantation in beaker at room temperature of 25 °C with the volatilization of the xylene and deposition of dried material film on glass substrate under agitation by Settling process [2,3]. The thin film gel formed of pristine PP and modified PP 12.5 kGy (i.e., irradiated) was characterized using scanning electron microscopy (SEM), field emission scanning electron microscopy (FESEM) and atomic force microscopy (AFM). The PP morphology indicated the nanogels (Figure 1), nanofibers (Figure 2) and microgels (Figure 3) formation with increase of spherulitic concentration and fibers at dose of 12.5 kGy.

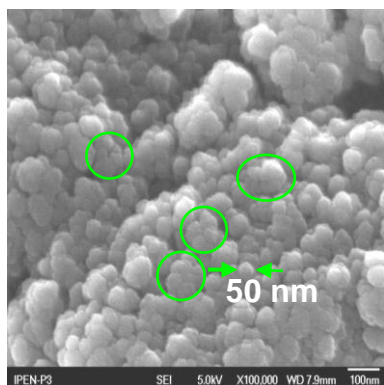


Figure 1 - Nanogels

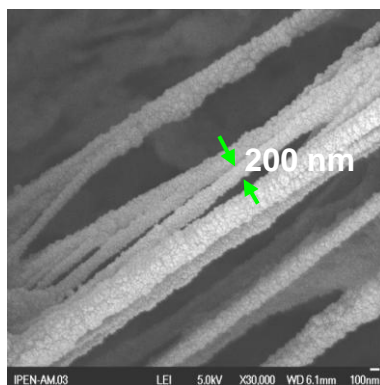


Figure 2 - Nanofibers

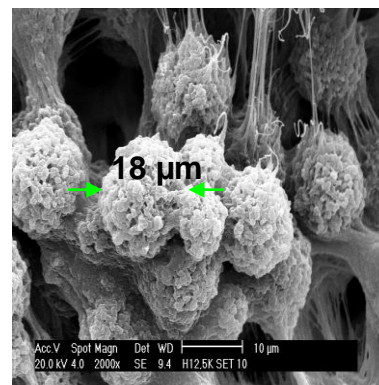


Figure 3 - Microgels

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## References:

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- [3] W. L. Oliani, D. F. Parra, D. M. Fermino, H. G. Riella, L. F. C. P. Lima, A. B. Lugao, Study of gel formation by ionizing radiation in polypropylene, *Radiat Phys Chem* 84 (2013) 20-25.