

# **Impact of Proton Irradiation on Medium Density Polyethylene/Carbon Nanocomposites for Space Shielding Applications**

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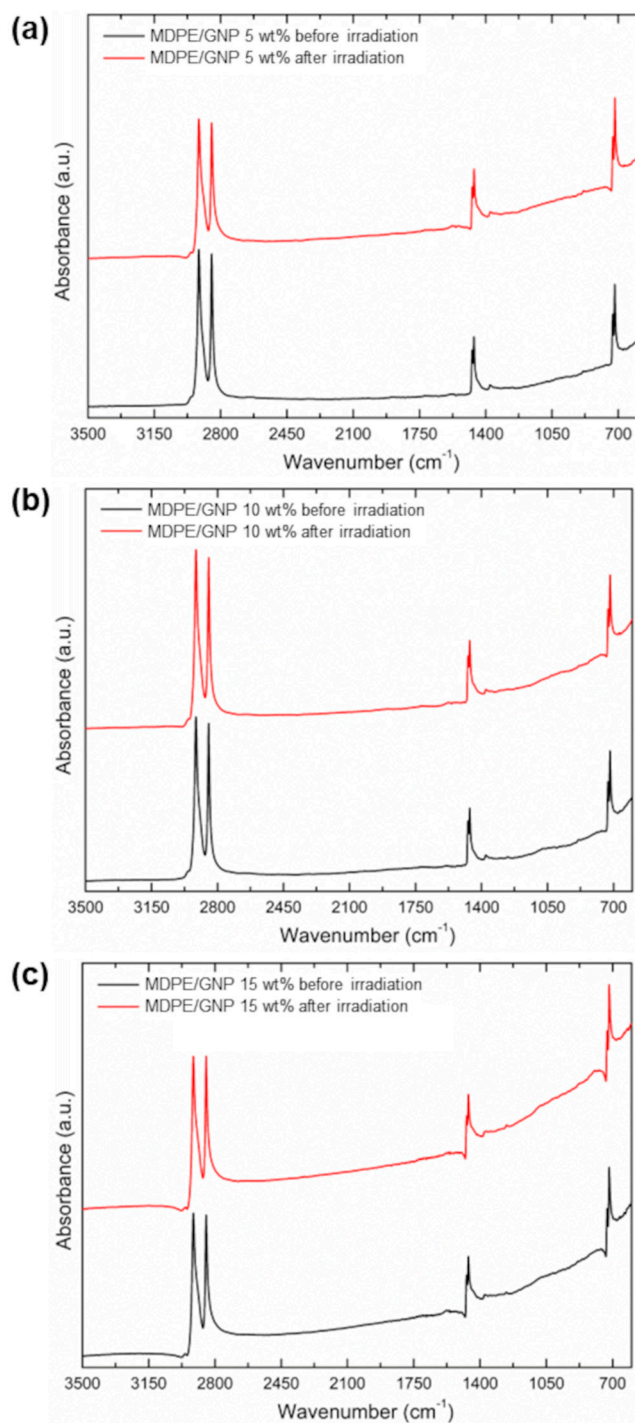
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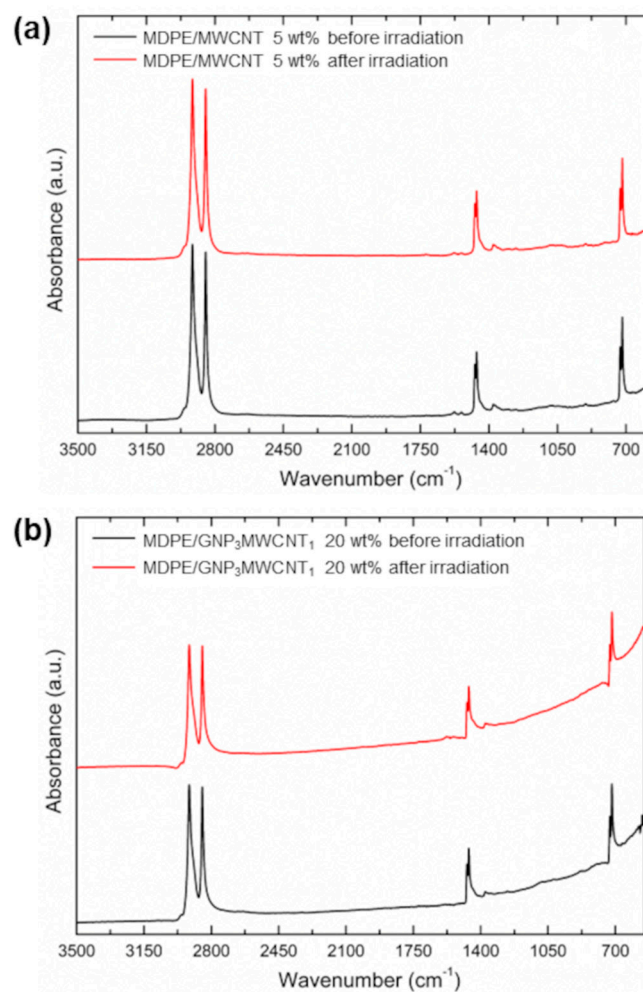
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**Figure S1.** ATR-FTIR spectra (raw data) of **(a)** MDPE/GNP 5 wt%, **(b)** MDPE/GNP 10 wt% and **(c)** MDPE/GNP 15 wt% nanocomposites before and after proton irradiation. Data are offset for clarity.



**Figure S2.** ATR-FTIR spectra (raw data) of (a) MDPE/MWCNT 5 wt% and (b) MDPE/GNP<sub>3</sub>MWCNT<sub>1</sub> 20 wt% nanocomposites before and after proton irradiation. Data are offset for clarity.

**Table S1.** ATR-FTIR data of non-irradiated and irradiated nanocomposites: intensities of the 729 cm<sup>-1</sup> (I<sub>a</sub>) and 718 cm<sup>-1</sup> (I<sub>b</sub>) peaks and their ratio (I<sub>a</sub>/I<sub>b</sub>).

<b>Non-irradiated</b>	<b>I<sub>a</sub></b>	<b>I<sub>b</sub></b>	<b>I<sub>a</sub>/I<sub>b</sub></b>
MDPE/GNP 5 wt%	0.133	0.211	0.630
MDPE/GNP 10 wt%	0.129	0.209	0.617
MDPE/GNP 15 wt%	0.126	0.233	0.541
MDPE/MWCNT 5 wt%	0.138	0.212	0.651
MDPE/GNP <sub>3</sub> MWCNT <sub>1</sub> 20 wt%	0.118	0.199	0.593
<b>Irradiated</b>	<b>I<sub>a</sub></b>	<b>I<sub>b</sub></b>	<b>I<sub>a</sub>/I<sub>b</sub></b>
MDPE/GNP 5 wt%	0.148	0.249	0.594
MDPE/GNP 10 wt%	0.126	0.215	0.586
MDPE/GNP 15 wt%	0.133	0.252	0.528
MDPE/MWCNT 5 wt%	0.133	0.208	0.639
MDPE/GNP <sub>3</sub> MWCNT <sub>1</sub> 20 wt%	0.105	0.187	0.561

I<sub>a</sub>: intensity of the band at 729 cm<sup>-1</sup>; I<sub>b</sub>: intensity of the band at 718 cm<sup>-1</sup>