

Comparative study of first- and second-order Raman spectra of Reticulated Vitreous Carbon treated at different temperatures

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First- and second-order Raman spectra for reticulated vitreous carbon (RVC) and highly ordered pyrolytic graphite (HOPG) were investigated using a laser excitation wave length of 514.5 nm. The spectra were recorded at room temperature. The RVC samples were made from thermosetting resins used to impregnate polyurethane foams. The resin on the foam was hardened through curing reaction and was carbonized at different heat treatment temperature. Besides, the RVC were analyzed by [field emission gun scanning electron microscopy](#) (FEG) and x-ray diffraction. The crystallite size L_a was obtained for both X-ray diffraction and Raman spectrometry techniques. The first- and second-order Raman for both RVC and HOPG were compared [1]. The overtones and the combination bands of HOPG were observed. It was clear observed the evolution of bands 2460, 2700, 2732, 2963 and 3249 cm^{-1} as a function of the heat treatment. In this range of carbonization temperature (1300 -2300 K) studied, different contributions are important to understand the Raman spectra evolution specially for the second-order. The heteroatoms presence represents a dominant contribution in surface interaction process creating the different features observed in the first- and second-order spectra.

References:

[1] [Sadezky, A](#); [Muckenhuber, H](#); [Grothe, H](#); [Niessner, R](#); [Poschl, U](#), Carbon, vol 43, pages 1731-1742, 2005.