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Water - Based TiO₂ Suspensions: A Raman Study ROBERTO RANGEL, DORINA CHIPARA, BRIAN YUST, DESIREE PADILLA, MIRCEA CHIPARA, The University of Texas Rio Grande Valley — The antibacterial features of TiO₂ are under scrutiny due to the UV radiation, which contributes to the generation of reactive oxygen species, mainly in water environments. A study of TiO₂ suspensions in water and broth is reported. TiO₂ has a low solubility in water. TiO₂ (anatase), with average diameter of 15 nm from Nanostructured & Amorphous Materials, Inc. has been added to the fluid (water, broth) and the mixture was stirred for 1-10 h, followed by a 10-60 minutes sonication. The suspension was left to sediment for 1 day before measurements. Quasistable suspensions of TiO₂ in water and broth were investigated by Raman spectroscopy using a Renishaw InVia spectrometer operating at 532 and 785 nm. The spectra of the nanofiller have been simulated by a collection of Breit-Wigner Fano line shapes and the effect of the preparation conditions (stirring and sonication time) on the parameters of Raman lines are reported. The differences are explained by observing that the sonication destroys the agglomerates of anatase resulting in a better dispersion of nanoparticles and consequently a longer sedimentation time. Sample preparation/storage have been done both under dark and UV light conditions.

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