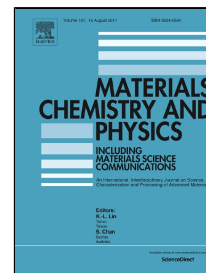


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Surface modification after ethanol wet milling: A comparison between pristine glasses produced from natural minerals and analytical grade raw materials.

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Abstract

Four glass compositions were produced taking into account different theoretical Leucite (KAlSi₂O₆)/Bioglass 45S5 (45 % SiO₂, 24.5 % Na₂O, 24.5 % CaO, 6 % P₂O₅) ratios using analytical grade reagents only; and replacing some of the reagents by natural minerals, all that were found to be bioactive when they were transformed to glass ceramics. Glasses of particle size below 174 µm were wet milled using ethanol in a high energy planetary ball mill. After wet milling, samples with 25 and 30 % of theoretical Leucite content using reagents grade raw materials showed a higher dissolution rate in comparison to the same glasses made from natural mineral, while no differences were found on glasses with 40 and 50 % of Leucite theoretical content. Samples with higher dissolution showed a crystalline carbonate phase named Pirssonite on its surface, while on the rest of samples amorphous carbonates were present.

Keywords: Glass surface, bioactive glass, wet milling, XPS, FTIR.

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