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Quasi-amorphous pyro- and piezo- electric SrTiO₃. DAVID EHRE, VERA LYAHOVITSKAYA, Weizmann Institute of Science, Israel, IGOR LUBOMIRSKY, Weizmann Institute of Science, Israel — Recent publications about quasi-amorphous BaTiO₃ materials have demonstrated that non-crystalline ionic solids can exhibit pyro- and piezo- electricity. This posed a question whether the quasi-amorphous state is unique to BaTiO₃ or other compounds can form non-crystalline polar phases. We report that pulling through a temperature gradient converts amorphous thin (<100 nm) films of SrTiO₃ into a pyro- and piezoelectric phase, which is nevertheless non-crystalline according to XRD and SEM. Thus SrTiO₃ may form a quasi-amorphous phase. This implies that: (1) the quasi-amorphous state is not unique to BaTiO₃ but other compounds may form similar phases; (2) polarity of a compound in a quasi-amorphous phase is not related directly to the polarity of this compound in a crystalline form. In this view, one may expect that other quasi-amorphous phases will be found. Owing to the simplicity of their preparation, quasi-amorphous materials are very promising for future pyroelectric and piezoelectric devices that can be integrated with modern semiconductor technology.

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