

Dielektrinės ir feroelektrinės P(VDF-TRFE)/LiNbO₃ kompozitų savybės

Effect of LiNbO₃ nanofillers on dielectric and ferroelectric properties of P(VDF-TRFE) copolymer based composites

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Composites are considered to be any multiphase materials that show a combination of properties of their components. PZT, LiNbO₃ and BaTiO₃ are one of ingredients that can change the dielectric properties and the ferroelectric properties of polymer based composites [1, 2]. In this work we report on both the dielectric and the ferroelectric properties of the conventional polymer polyvinylidene fluoride / trifluoroethylene (P(VDF-TrFE)) of the composition 70/30 mol% with various concentrations of lithium niobate (LiNbO₃) fillers. By the means of dielectric spectroscopy it is shown that the dielectric properties may be tuned by varying the volume fraction of the ferroelectric fillers. Although, the dependencies of the dielectric, piezoelectric and ferroelectric properties of these composites on filler volume fraction could not be analyzed so simply by analytical Lichtenecker's model which was used for P(VDF-TrFE) based composites with BPZT fillers. It can be explained by lower value of the dielectric constant of lithium niobate fillers as compared to barium doped lead zirconate fillers.

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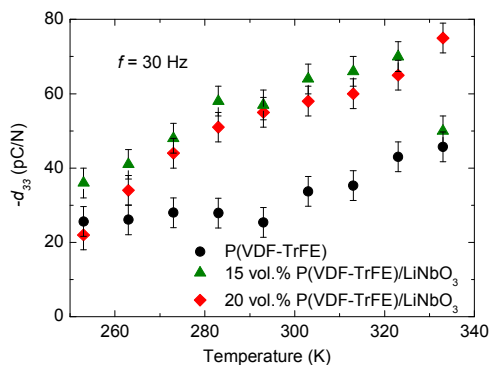


Fig. 1. Piezoelectric strain coefficients of P(VDF-TrFE) and P(VDF-TrFE)/LiNbO₃ composites at different temperatures.

Keywords: P(VDF-TrFE), LiNbO₃, ferroelectricity, dielectric spectroscopy,

References

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