**Dielectric Response of the Methylammonium Lead Halide Solar Cell Absorbers**

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Hybrid organic–inorganic perovskites have recently attracted overwhelming attention due to their excellent photovoltaic performance yielding efficiencies well exceeding 20%. This has been related to properties such as long charge carrier lifetime, the exceptionally large diffusion length, large absorption coefficient, high carrier mobilities, large open-circuit voltages, and direct band gap. The organo-lead trihalide perovskite compounds, CH3NH3PbX3, are the forerunners in efficiency.



Fig.1 Frequency dependence of dielectric constant at room temperature for MAPbX3 crystals.

In this presentation dielectric and acoustic properties in wide temperature and broad frequency range of organic – inorganic perovskites CH3NH3PbX3 (X = I, Br, Cl) will be shown. Figure 1 shows dielectric constant of the three MA – Pb – halides across wide frequency range at room temperature. Sections denote the dominant micromechanism contributing to dielectric response:

1. Ionic motion/Dirft, C) Anionic lattice dynamics (phonons),
2. MA –dipole relaxation, D) Internal vibration of the MA molecule.

References

[1] Anusca, I., Balčiūnas, S., Gemeiner, P., Svirskas, Š., Sanlialp, M., Lackner, G., ... & Dkhil, B. (2017). Dielectric response: Answer to many questions in the methylammonium lead halide solar cell absorbers. Advanced Energy Materials, 7(19).