

Abstract Submitted
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Effective polarizabilities of water clusters RAMIRO MORO, ROMAN RABINOVITCH, CHUNLEI XIA, VITALY KRESIN, University of Southern California — We report the measurement of electrical polarizabilities of water clusters $[(\text{H}_2\text{O})_n, n=3-18]$ by deflection of a supersonic beam in an inhomogeneous field. In all the clusters studied, the deflections are only towards higher fields, indicating a polarizability-like behavior. The highest polarizability per one water molecule is seen in the trimer ($7.9 \pm 0.3 \text{ \AA}^3$) and it quickly decreases for larger clusters to about 4 \AA^3 per molecule for $n=6-18$. These values are large and could be explained by the addition of two parts: an intrinsic electronic polarizability plus a contribution from a permanent dipole moment responding with a Langevin-like behavior. With a cluster temperature of $\sim 200 \text{ K}$, estimated from the evaporative ensemble picture, the permanent dipole moments are $\sim 1-2$ Debye per cluster.

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