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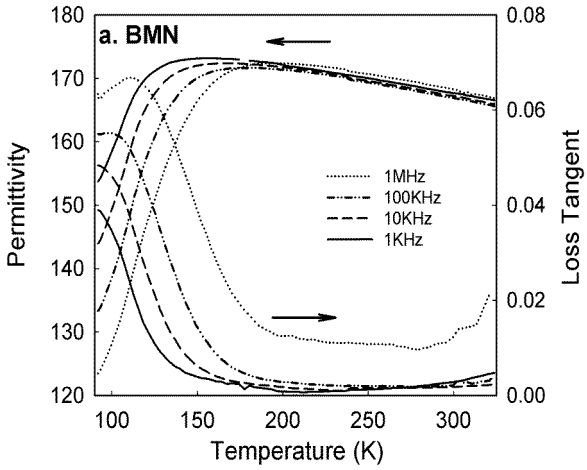
1. Development and optimization of promising microwave dielectric materials

This project targets the development of high performance microwave dielectric materials for use in the next generation of wireless communication devices (see *e.g.* T.A.Vanderah, *Science* **298**, 1182 (2002). It will involve the synthesis, structural investigation and measurement of the temperature-dependent dielectric properties (dielectric permittivity, see below, dielectric loss and temperature coefficient of capacitance) of some promising dielectric materials (see Ray and/or Yun for further info).



2. Smart multifunctional materials

This project aims to synthesize and investigate multifunctional materials *e.g.* dielectric materials whose dielectric permittivity can be tuned by an external electric and/or magnetic field, piezoceramic materials whose shape can be affected by an applied electric field *etc.* Such multifunctional materials have many potential applications *e.g.* tuneable dielctric materials have the potential to revolutionize electronics by consolidating components operating at different frequencies into the one field tunable component. Materials of this sort are currently dominated by so-called relaxor materials and typically exhibit a high dielectric constant over a broad temperature range as well as a significant frequency dispersion of this dielectric permittivity believed responsible for deleterious dielectric loss properties (see Ray and/or Yun for further info).