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Phase transition in BaThO₃ from *Pbnm* to *lbmm* turn the fundamental energy band gap from indirect to direct

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1. The phase transition in BaThO₃ cause energy gap changes from indirect to direct.
2. The calculated energy gap is about 4.9 eV (*Pbnm*) and 4.6 eV (*Ibmm*)
3. The *Pbnm* and *Ibmm* phases exhibit negative uniaxial anisotropy and birefringence.
4. At room temperature BaThO₃ is stable in the *Pbnm* phase.
5. At room temperature BaThO₃ is stable in the *Ibmm* phase.

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