

The coexistence of electrocaloric and magnetocaloric effect in $\text{Pb}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ ceramics

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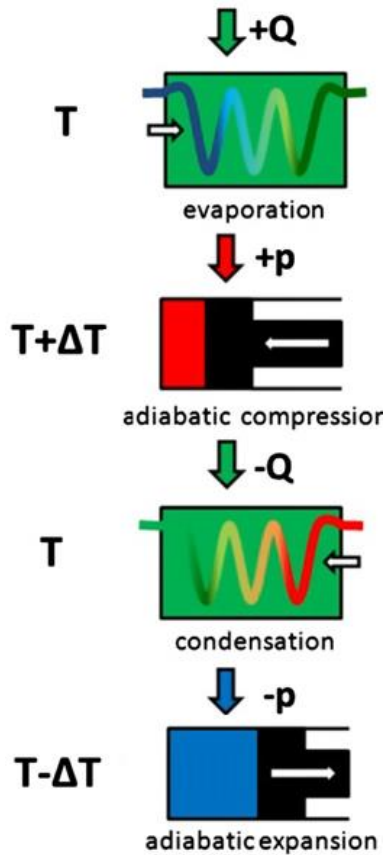
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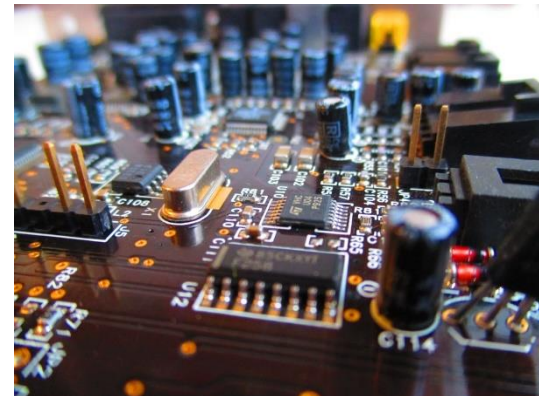
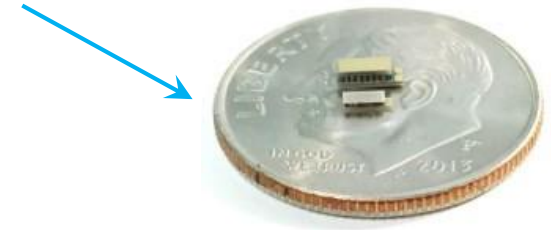
Cooling technologies

Vapor-compression refrigeration:



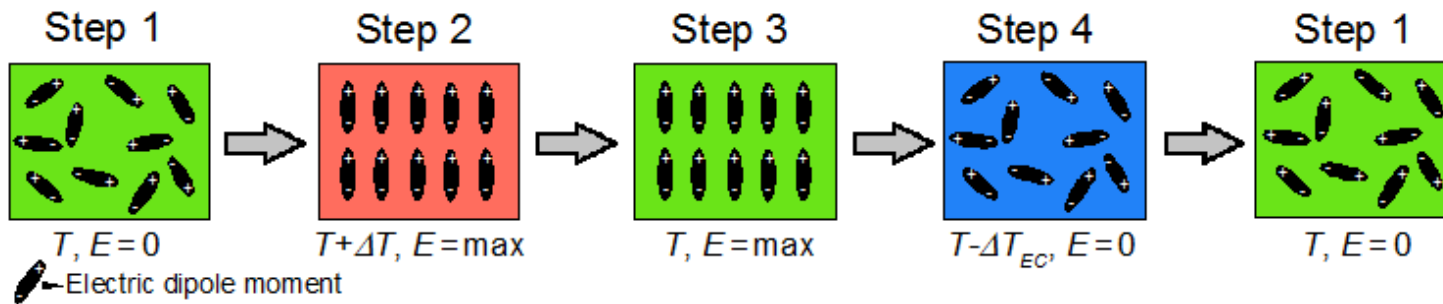
Solid-state cooling:

- no pollutant refrigerants,
- no noise and vibrations,
- suitable for small devices.

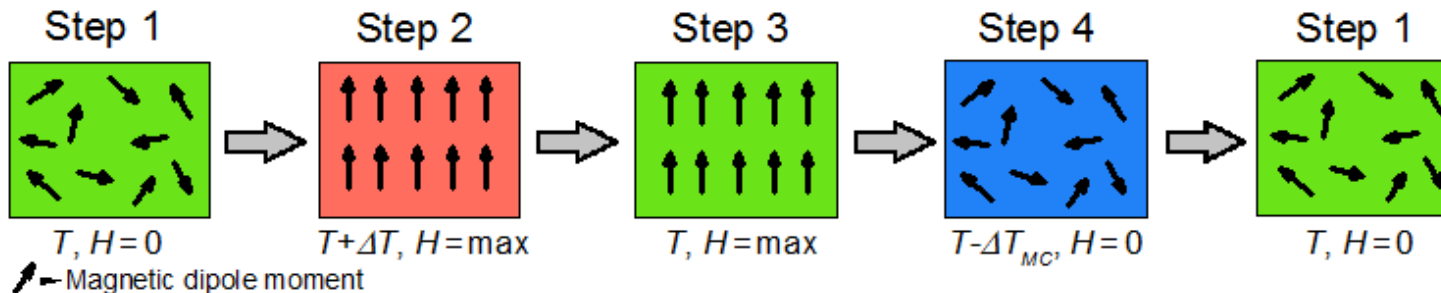


Electrocaloric and magnetocaloric effect

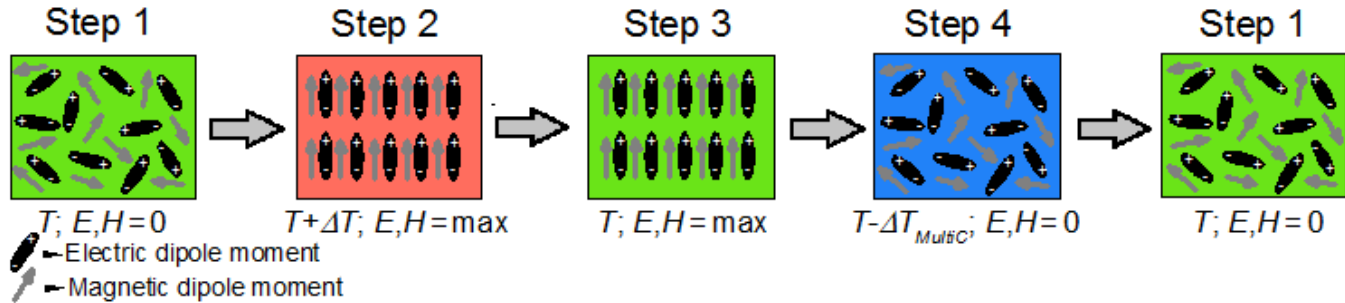
Electrocaloric (EC) effect: adiabatic and reversible temperature change of polar dielectric material under the influence of an external electric field.



Magnetocaloric (MC) effect: adiabatic and reversible temperature change of magnetic material under the influence of an external magnetic field.

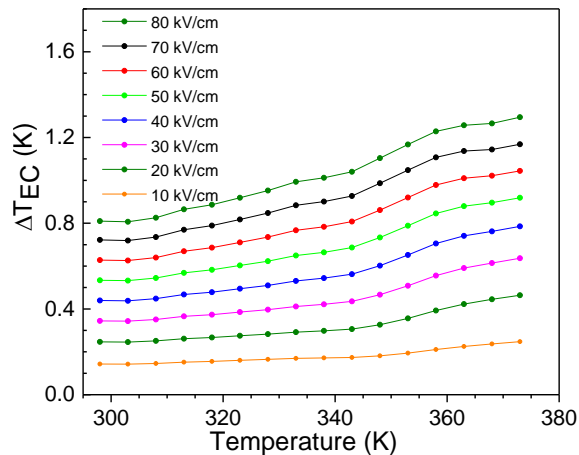


Multicaloric effect



The coexistence of EC and MC effect was experimentally confirmed in $\text{Pb}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ (PFN) ceramic material:

EC effect



MC effect

