

# **Influence of Crystallographic Phase Transitions in Small Ferroelectric Particles on Carbon Dioxide Adsorption**

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## **Abstract**

The aim of this work is to understand surface properties of ferroelectric crystals towards gas adsorption. Various ferroelectric crystals involved in these studies readily adsorb carbon dioxide, thus our studies were centered on adsorption studies of this molecule. It has been claimed by other authors that a dipole moment is induced on carbon dioxide molecules that are near an oxide surface. Thus, our experiments explored the possibility of a dipole-dipole interaction between the gas molecule and the ferroelectric oxide surface in order to explain its adsorption. We describe Raman studies of small particles of  $\text{BaTiO}_3$  and  $\text{KNbO}_3$  in order to determine the ferroelectric nature of the particles as well as to study the temperature dependent phase transitions. We were able to correlate desorption of  $\text{CO}_2$  with the occurrence of the Curie transition in  $\text{BaTiO}_3$  and with the orthorhombic to tetragonal transition in  $\text{KNbO}_3$  in particles of 50 nm size.