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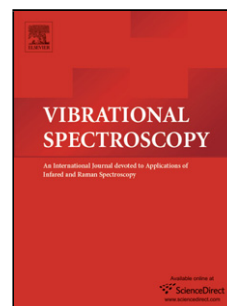
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# Effects of carbon dioxide captured from ambient air on the infrared spectra of supported amines

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## **Abstract**

The amino groups in highly dense coatings of amines on solid supports react with the CO<sub>2</sub> of ambient air and form ammonium-carbamate ion pairs. These ion pairs change the properties of the amine-modified supports. In numerous studies, the corresponding infrared (IR) spectra have been misinterpreted. The presumption has been that such ion pairs would not form in ambient air, and IR bands have been assigned to the moieties of the support and the amines. Here, we discuss common misunderstandings of the IR spectra of amine-modified supports and highlight that proper sample handling is necessary before employing different characterization techniques. We exemplify by performing an IR spectroscopic study of propylamine-modified porous silica. Such amine-modified supports are relevant to applications in gas separation, catalysis, controlled drug delivery and adsorption of pollutants from water.

**Keywords:** Amine-modified silica; CO<sub>2</sub> adsorption; Infrared spectroscopy; PEI; TEPA; CO<sub>2</sub> capture

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