A total fluorine analyzer with an unprecedented high level of sensitivity as a conventional method

Easy and rapid analyses of PFOS and total fluorine in environmental samples and industrial products

We have developed a fully automatic total fluorine-analyzing system with an unprecedented high level of sensitivity. This analyzing system is based on the conventional halogen analyzer that uses combustion ion chromatography (CIC). A higher level of sensitivity was achieved by replacing the fluorine-containing materials in part of the equipment and in the gas-supply line, which have the potential for fluorine contamination, with non-fluoropolymer materials and by using gases of higher purity for the sample combustion. Our new system permits the quantitative analysis of absolute amounts of 0.6 ng fluorine. The analyzer allows easy, rapid, and sensitive analyses of the total fluorine and organic fluorine compounds that are present in various environmental samples and industrial products. It can also be used to analyze compounds that contain chlorine or bromine. Thus, it is suitable for ensuring compliance with the EU RoHS directive and with potential future regulations on fluorinated compounds, such as the EU's REACH legislation.

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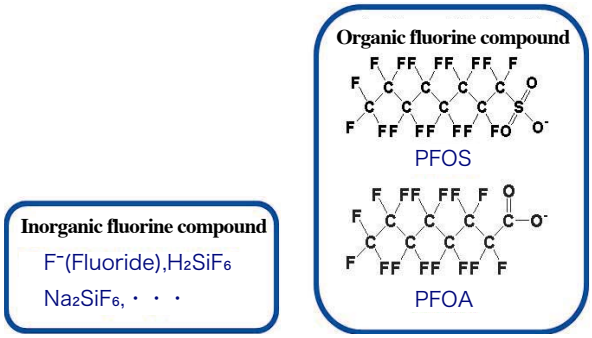
AIST TODAY Vol.8, No.1 p.28 (2008)



All fluorine compounds

Development of new gas separation methods using ionic liquids

Technology for global warming with advantage of specific absorption phenomena of acidic gases

Ionic liquids are environmentally benign solvents because of their less volatile and nonflammable natures. Ionic liquids have very high and selective solubilities of acidic gases such as CO_2, SOx, and NOx. By means of X-ray diffraction measurements, we have revealed that CO_2 dissolved in an ionic liquid is preferentially solvated to anion species. This implies that there is the Lewis acid-base interaction between the positive carbon atoms of CO_2 and negative fluorine atoms of anion in the ionic liquids. In contrast, for lack of specific interaction site, nonpolar gases such as H_2 and N_2 do not generally dissolve in ionic liquids. The unique physical absorption property in ionic liquids should open doors for new gas separation methods.

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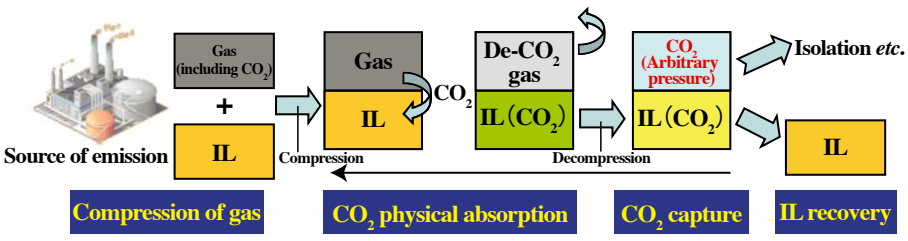
AIST TODAY Vol.8, No.3 p.27 (2008)



Outline of carbon dioxide (CO_2) physical absorption method by using ionic liquids (IL)