

PTR-MS-based method for continuous measurements of dissolved volatile organic compounds in surface seawater

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Trace gases, including DMS and volatile organic compounds (VOCs), play important roles in environmental issues and have interesting biological implications. Previous studies using conventional gas chromatographic techniques demonstrated that dissolved light hydrocarbons (\sim C₄ alkanes or alkenes) were existing in surface seawater, which were probably produced in the decomposition of dissolved organic matters by UV irradiation and/or biological metabolism. On the other hand, it is difficult to detect heavier hydrocarbons and oxygenated VOCs (OVOCs) with conventional methods because of their high reactivity, and there have been limited data reported so far.

Proton transfer reaction-mass spectrometry (PTR-MS) is a technique that allows on-line measurements of atmospheric VOCs with high sensitivity (\sim pptv) and rapid response time (0.1-10 s). PTR-MS measurement is suitable for detection of heavier hydrocarbons and OVOCs. In this study a new instrument coupling PTR-MS and an equilibrator was designed and built for continuous detection of dissolved VOCs. The system is currently tested both in laboratory and at lake nearby our institute. Details of our measurement system and preliminary results will be presented and discussed.