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# The use of chemical sensing technologies for the detection of dissolved hydrocarbons within water

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In-situ sensing technologies currently employed for the detection of hydrocarbons within aqueous media, from oil seepage through to contaminant monitoring, take two forms: either non-specific detection of bulk hydrocarbons using low cost equipment, or detailed conventional separation and detection of hydrocarbon species using high cost laboratory type analytical devices. With the rapid development of the fields of materials sciences and microelectronics, new selective or semi-selective hydrocarbon sensing devices which can operate within the aqueous environment are feasible. Currently, within the areas of process control and atmospheric monitoring, low cost devices with detection and identification abilities which can rival those of laboratory instruments are beginning to enter the market.

Chemical sensor devices consist of a sensing element (a receptor) and a transducer (which allows measurement of the sensing event). The presented research takes a multifaceted approach, exploring multiple receptor types and transduction mechanisms in order to detect hydrocarbon species within the aqueous phase.

This paper reports on the use of different sensing elements from semi-selective polymeric films through to synthetic receptors in conjunction with different transduction platforms such as quartz crystal microbalances, chemiresistors and infrared spectroscopy for the detection of hydrocarbons in water. The analytical properties and suitability of various materials are investigated and reported upon.