Miniature, all-solid-state ion-selective sensor as a detector in autonomous, deployable sensing device

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Lowering of the detection limit of ion-selective electrodes (ISEs) as well as their simple construction, low production cost and low power requirements make ISEs an ideal candidate for detector systems that can be integrated into autonomous, deployable sensing devices. Routine analysis and early warning systems are applications that first spring to mind, however great added value can be obtained by integration of many such devices into a wireless sensing network.

In this work we describe our work towards the miniaturization of ISEs and their integration of with all-solid-state reference electrode into an all-solid-state sensor with a view of integration in autonomous, deployable sensing device. This work has two avenues: 1) development of a platform that can house all-solid-state ISEs and reference electrodes and 2) development of electronic circuitry for data acquisition and *wireless* transmission of the data. The latter utilizes novel, *in-house* made motes (a node in a wireless sensor network that is capable of performing some processing, gathering sensory information and communicating with other connected nodes in the network) that operate at lower frequency and therefore consume lower power then other, commercially available ones. In addition, they are easier to program which bridges the gap of communication between chemists and computer scientists.

Intensification of the work in producing all-solid-state reference electrodes has enabled us to work on development of a platform that houses all-solid-state ISEs and reference electrode. We will here describe our progress in this avenue of our research.