

Adsorption sensor systems based on quartz crystal microbalance (QCM)

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An adsorption sensor system has been fabricated on a quartz crystal microbalance (QCM) to measure the mass of gases adsorbed on the surface. Functional polymers or microporous adsorbent particles are coated on AT-cut quartz crystal surfaces as sensing materials for target gases. The sensitivity and selectivity for target gases should be measured to design the sensing system. All single component adsorption data are practically linear at very low concentration levels. Based on single component data, the concentrations of target gases in their mixture can be determined by applying multicomponent equilibrium relationships such as an extended Langmuir equation and the ideal adsorbed solution theory. The adsorption sensor array fabricated on a QCM could be a promising sensor system for monitoring multiple target gases in the mixture of ppm levels.