Incorporation of Carbon Nanotubes into Microstructured Materials for Preconcentration of Trace Gases

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The integration of carbon nanotubes into micro-structured materials allows an engineered support structure for the contacting gases with nanomaterials where high heat-transfer rates can be achieved. Such structures are being investigated for trace gas preconcentration. Preconcentrators employ a high surface-area material that adsorbs gases of interest when sampled gas is passed above the substrate. This material is then heated rapidly to drive off the adsorbed gas at relatively high concentration for downstream sensors. The integration of nanomaterials with microstructures allows very small dimension and applicability to small deployable systems. The structures examined, their surface chemistry, performance, and coupling to microsensors will all be discussed.