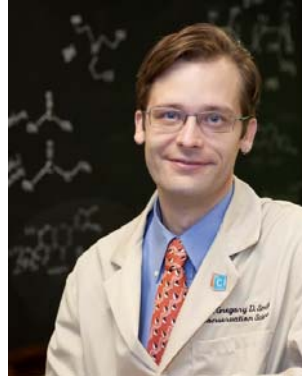
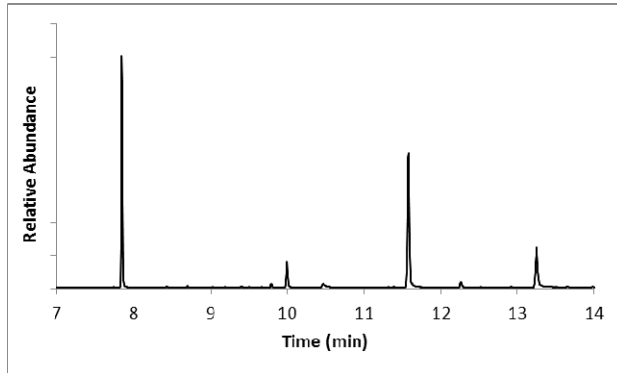


# New approach to an old problem: Evaluation of pollutant offgassing from materials used in the museum environment



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Preservation of cultural heritage in museums requires that only non-corrosive, non-polluting materials be used in proximity of artwork. Historically, the off-gassing potential of construction materials used in museums has been tested with subjective microchemical and accelerated corrosion methods, such as the Oddy test. In this research, The IMA Conservation Science Lab working with Butler University's Chemistry and Biochemistry Department investigated gas chromatographic methods coupled to mass spectrometry as an alternative for rapidly detecting, identifying, and quantifying pollutant emissions from sample materials. We have developed an alternative sampling strategy based on evolved gas analysis (EGA) to monitor Volatile organic compounds (VOCs) emitted from materials. The goal of this work is to link the identity and possibly the quantity of VOCs generated by a material under accelerated emission conditions to visual evidence of material suitability provided by Oddy tests, microchemical tests, and damages observed in real life situations.

Chromatogram for the EGA-GC-MS analysis of black polyester polyurethane packing foam. Peaks were identified by their mass spectrum as the internal standard hexadecane (7.85 min) and off-gassed pollutants 4-decylmorpholine (10.00 min), 4-dodecylmorpholine (11.58 min), and 4-tetradecylmorpholine (13.26 min).

# MCI

## *Topics in Museum Conservation*

**August 25, 2017**  
**10:45 am**  
**Friday**

### ***MCI Theater***

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