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Northeastern Section - 50th Annual Meeting (23–25 March 2015)

Paper No. 36-5

Presentation Time: 8:00 AM-12:00 PM

BRINGING VIBRATIONAL SPECTROSCOPY INTO THE GEOLOGY CLASSROOM

John B. Brady, Department of Geosciences, Smith College, Northampton, MA, M. Darby Dyar, Dept. of Astronomy, Mount Holyoke College, South Hadley, MA and Eileen M. McGowan, Math, Physics, and Computer Science, Springfield College, Springfield, MA Fourier transform infrared (FTIR) spectroscopy and Raman spectroscopy are increasingly used by geoscientists and others in their research. Recent advances in the development of commercially available Raman and FTIR spectrometers make this technology accessible to students and faculty in the geosciences for whom spectroscopy has not traditionally been a focus. These spectrometers are powerful tools that significantly expand our capability to identify and characterize geological materials and provide excellent opportunities to build analytical competence through their careful use in geoscience curricula. We have been exploring the use of vibrational spectrometers in our courses and report here on our initial experiences using an FTIR spectrometer in introductory geoscience classes. In particular, we have used the Brucker Alpha™ benchtop FTIR with several of their QuickSnap™ sampling modules for hand samples (reflection module), powders (ATR module), and gems or chips (diffuse reflection module). Data collection is easy for students with little training. Mineral identification can be confirmed by students through comparison with standard spectra, either manually or using the Brucker OPAL™ software. For best results, we have created standards libraries with a limited number of minerals both with RRUFF (www.ruff.info) files and with data collected on the samples in use. Students report that they like the identification clarity that the spectrometers typically provide and feel frustration when the spectra are not sufficiently unique. We use the activities involving the spectrometers to introduce additional concepts about crystal structures and the vibrational energies of bonds. Our plan is to build on these concepts with more in-depth spectroscopic work in intermediate and advanced courses. Come to our poster to use the FTIR spectrometer, which is portable enough to bring to NE GSA.

Handouts

- [15 NEGSA Poster_Finalc.pdf](#) (27.7 MB)

Session No. 36--Booth# 5

[Geoscience Education \(Posters\)](#)

Tuesday, 24 March 2015: 8:00 AM-12:00 PM

[Presidential Ballroom \(Omni Mount Washington Resort\)](#)

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