



Figure 5.5. Houchin Creek Shale (Sample HCS-IN). EDS spectra for pyrite and muscovite (phengite). The EDS spectra show the elemental compositions at discrete spots in polished thin sections. The vertical bars are the reference positions for characteristic x-ray lines in electronvolts (keV). Pyrite is indicated by iron (Fe) peaks between 6 and 8 keV and sulfur (S) peaks just above 2keV. Muscovite is indicated by peaks for silicon (Si), aluminum (Al), potassium (K) with minor peaks for magnesium (Mg), iron (Fe) and titanium (Ti). Carbon (C) is detected because the samples are carbon-coated for analysis; traces of oxygen (O) are always present.

SEM spectra confirm identification of pyrite and show that some of the muscovite in HCS-IN contains minor amounts of iron and titanium, which agrees with the XRD identification of phengite (Figure 5.5). Carbon-rich organic material contains sulfur. The sulfur may be present as finely disseminated pyrite too small to be resolved by SEM. The SEM study confirmed the presence of gypsum and apatite, and also identified trace amounts of chalcopyrite.