A simple analytical method for phenols in geological organic matter

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Lignin, a kind of polymer, is the dominant component in the cell walls of plants and wood, and often has been used to indicate the terrestrial organic matter input in coastal sediments and terrestrial sediments, for their abundance and stability in vascular land plants, but lack in the phytoplankton and animals predominated in the ocean (Onstad et al., 2000). Phenols, as one of the degradation products of lignins, are usually chosen to determine the abundance, source of lignin. Thus, lignin phenol in geological organic matter can be an indicator to distinguish angiosperms and gymnosperms, and woody tissue and non-woody tissue.

Previously, scholars usually followed the method by a N,O-Bis(trimethylsilyl)trifluoroacetamide derivatisation reaction, namely analyzing phenol derivatives with GC (gas chromatography) or GC-MS (gas chromatography - mass spectrometry). It needs much complex pretreatment processing and may cause deviations from these complex steps. In consideration of these, we propose to use UPLC-HRMS (ultra performance liquid chromatography - high resolution mass spectrometry) combined with SPE column separation, to simplified pretreatment processing and reduce deviation as far as possible. Moreover, this method gets good repetition, repeatability and recovery with a series of phenol standard compounds.

Reference

Onstad, G.D., Canfield, D.E., Quay, P.D., Hedges, J.I., 2000. Geochimica et Cosmochimica Acta 64, 3539-3546.