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INVESTIGATION OF KUKERSITE STRUCTURE USING NMR AND OXIDATIVE CLEAVAGE: ON THE NATURE OF PHENOLIC PRECURSORS IN THE KEROGEN OF ESTONIAN KUKERSITE

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Oxidative cleavage of Estonian kukersite kerogen, model 5-alkyl-1,3-benzenediols and their dialkyl ethers under alkaline $KMnO_4$ and ruthenium ion catalyzed oxidation conditions, followed by CP/MAS ^{13}C NMR and GC-MS studies of products, was carried out. Based on the stability of ether model compounds under alkaline $KMnO_4$ oxidation conditions, full oxidizability of kerogen into low-molecular acidic products and similar carbon type composition of $KMnO_4$ treated and intact kerogen, it was assumed that alkylbenzenediols are bound to the kerogen structure via cross-links in alkyl chains (and possibly via aryl-aliphatic monoether bonds as well). Location of free phenolic hydroxyl groups is determined by hydrogen bonds. Earlier determinations of "apparent" aryl-aliphatic ether bonds, using ether-cleaving HI and bulk $AlBr_3$ reagents under severe conditions, were discussed and the action of trimethylsilyliodide and $AlBr_3$ on the model compounds was examined as well.