COAL AS A MICROPOROUS SOLID

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ABSTRACT

By saying that coal is a microporous solid, we mean that it possesses a significant void volume and area in small pores. A large fraction of these pores exhibit molecular-sieve properties, i.e., they are certainly under 10A in size. Some of the pore volume is even inaccessible to helium at room temperature. A close approximation of the exact size of the pores is difficult since we do not know precisely what arrangement of carbon and other atoms exists in the pore walls. If we can assume that the walls are predominantly basal planes of small graphitic-like crystallites, then we can make a closer estimation of the size of the pores. This is discussed. The use of the BET and Dubinin-Polanyi equations to estimate surface areas (or micropore volumes) of coals is discussed. The amount and nature of the micropore volume in coals can be changed drastically by both thermal treatment and gasification. The latter process is of particular interest, since gasification enlarges the size of very small micropores, thereby converting coal into a commercially acceptable activated carbon material. Some fundamentals of activation and techniques to achieve better activation of coals will be considered.

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