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# Oxidative Power of Smectites Measured by Hydroquinone

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**Abstract:** The oxidative power of a smectite can be measured quantitatively by oxidation of hydroquinone to *p*-benzoquinone in a clay slurry. Oxidation takes place in the presence of O<sub>2</sub> (air) but not N<sub>2</sub> unless Fe<sup>3+</sup> or Cu<sup>2+</sup> are the exchangeable cations. This study examined 26 smectite samples with varying compositions and processing. The oxidative power increases with decreasing Li-fixation and increasing cation exchange capacity. Li-fixation does not depend upon the tetrahedral Al. The cation exchange capacity can decrease markedly by mere storage in water.

The oxidation proceeds principally on the surface by adsorbed oxygen molecules or radicals. A mechanism is proposed. With Fe<sup>3+</sup> or Cu<sup>2+</sup> present, even under N<sub>2</sub>, oxidation occurs via electron transfer. With smectites containing Fe<sup>2+</sup>, both the Fe and the hydroquinone are oxidized in the same reaction.

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