Qualitative distinction of carboxyl groups distributions in pectins with ruthenium red.

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Abstract

Ruthenium red binding to free carboxyl groups of commercial pectins with different degrees of esterification (DE, 0%, 31%, 63% and 93%) was investigated. The optimal binding condition of ruthenium red for carboxyl groups was further studied using self-prepared pectins of different DE (0% to 80%). These were prepared by treatment with either sodium hydroxide (for random type) at 4°C or commercial pectinesterases of orange sources (for blockwise type) at 30°C. The results revealed different relationships between DE from different treatments and the corresponding DA534 nm value, a measure of the amount of bound ruthenium red. Negative first order (r = -0.995) and negative second order (r = -0.998) regression correlations were found, respectively, with sodium hydroxide-treated and pectinesterase-treated pectins. Ruthenium red binding to pectin might distinguish blockwise carboxyl group distributions from random ones in pectin molecules.