

magnetic circular dichroism (MCD)

A measurement of *circular dichroism* of a material which is induced by a magnetic field applied parallel to the direction of the measuring light beam. Materials which are achiral still exhibit MCD (the Faraday effect), since the magnetic field leads to the lifting of the degeneracy of electronic orbital and spin states and to the mixing of electronic states. MCD is frequently used in combination with absorption and CD studies to effect electronic assignments. The three contributions to the MCD spectrum are the A-term, due to Zeeman splitting of the ground and/or excited degenerate states, the B-term, due to field-induced mixing of states, and the C-term, due to a change in the population of molecules over the Zeeman sublevels of a *paramagnetic* ground state. The C-term is observed only for molecules with ground-state paramagnetism, and becomes intense at low temperatures; its variation with field and temperature can be analysed to provide magnetic parameters of the ground state, such as spin, g-factor, and zero-field splitting. Variable-temperature MCD is particularly effective in identifying and assigning electronic transitions originating from paramagnetic *chromophores*.

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