

## 14.4: The Magnetic Field Acting upon Nuclei in Molecules Is Shielded

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An isolated nucleus in an external magnetic field experiences the external magnetic field. However, a nucleus in a molecule, when the molecule is placed in an external magnetic field, does not experience the external magnetic field, due to interference by the magnetic field generated by the surrounding electrons. The magnetic field experienced by the nucleus is either slightly lower than the external magnetic field or slightly higher. If the magnetic field experienced by the nucleus is lower than the external magnetic field, the nucleus is said to be shielded; if it is higher, the nucleus is said to be deshielded.

- $B_x$  = the external magnetic field
- $B_y$  = the magnetic field experienced by the nucleus

If  $B_y < B_x$ , the nucleus is shielded. If  $B_y > B_x$ , the nucleus is deshielded

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