

ABSTRACT

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This project extends the earlier investigations of several workers [1,2,5,6] on the symmetry properties of anti-ferromagnetic NiO and CoO.

In the first part we have summarised very briefly the results of these early investigations. We have used standard group theoretical methods to study the crystal field splittings, symmetry properties of excitons and symmetry characters of the zero wave vector two-magnon states. The latter are useful for determining the selection rules for two-magnon absorption, and we have in fact derived these selection rules for CoO.

In the second part we report the calculation of magnon dispersion curves along all the important symmetry directions of the antiferromagnetic Brillouin zone of NiO and CoO and compare the results with the group theoretical predictions of Part 1. We also make some comments on the recent work of Daniel and Cracknell [6].

Finally we make some suggestions for future work on the magnon density of states and the magnon contribution to the specific heat of these compounds.

TWO - MAGNON ABSORPTION

3.1 Selection rules for CoO

3.2 Selection rules for NiO