

THE SCATTERING OF X-RAYS BY CRYSTALS.

By

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Synopsis.

(1) The scattering of x-rays by the crystals calcite and rocksalt was measured. The scattering curves are compared with the scattering curves of amorphous substances such as glass and aluminum. For scattering angles between 50° and 150° , the curves for the crystals coincide with the curves for glass and aluminum if the curves are all reduced to the same ordinate at 90° . For scattering angles below 50° , the crystal curves fall below the curves for glass and aluminum, reaching maxima at angles between 15° and 30° . Below these maxima the curves appear to slope down towards zero. These maxima occur at much greater angles than the maxima of the curves of non-crystalline substances. Both the crystal curves and the curves for aluminum and glass show a minimum at 100° . For the crystal curves both homogeneous and heterogeneous x-rays were used.

(2) The diffuse scattering is accompanied by regular reflection from the appropriate planes in the crystal. This regular reflection can be removed by slightly turning the crystal. For the width of x-ray beams used the total energy scattered was quite an appreciable part of the energy reflected in a spectrum line.

(3) A comparison between the experimental results and the theory of crystal scattering as developed by Debye is made. It is found that Debye's theory is not in accord with the facts.

(4) The scattering in a particular direction is not altered by changing the orientation of the crystal, implying that the atoms are nearly isotropic.