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The Reflecting and the Absorbing Power of a Photographic Emulsion

P. S. Helmick
where \( \nu \) = critical frequency in ultra-violet (\( v \)) or infra-red (\( r \)),
\( N \) = Avogadro's constant,
\( h \) = Planck's element of action,
\( M \) = molecular weight of the substance,
\( n \) = valency of atom to which electron belongs,
\( e \) = charge on an electron,
and \( r = \frac{1}{2} \) distance between two neighboring atoms.

Substitution of known experimental values into the four formulae predicts the existence of a natural ultra-violet frequency of silver bromide in the neighborhood of 1900\( \AA \).

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(ABSTRACT)

Measurements have been made upon the reflecting and the absorbing power of silver bromide emulsion with wave-lengths between 2100\( \AA \) and 5782\( \AA \). The reflecting power of silver bromide emulsion averages about 7 per cent for the region 2100\( \AA \) to 5200\( \AA \). A thickness of emulsion (0.021 mm) as found in a commercial photographic film absorbs about 96 per cent of incident radiation between 5218\( \AA \) and 5782\( \AA \), and more than 99.99 per cent of radiation whose wave-length is less than 3247\( \AA \). From 5782\( \AA \) to at least 2294\( \AA \) the gelatine in a photographic emulsion has a negligible absorption as compared with the absorption of the silver bromide of the emulsion.

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