

factor more precisely in numerical terms is pointed out. A method of defining gloss in terms of the relative intensity of diffusely and regularly reflected light is outlined. The goniophotometer, an instrument for measuring the distribution of the light reflected from a surface, is described and the method of computing the gloss of the surface from the readings obtained is outlined. The determination of gloss by this method requires two measurements of the brightness of the surface at different angles. In order to eliminate the errors inherent in such a method, a special instrument called a "gloss meter" was designed and constructed whereby the gloss of any surface may be determined by a single reading. This instrument is described. Gloss measurements on a large number of developing-out papers are given, and the effect upon gloss of various surface treatments of the raw stock is determined. From an analysis of the readings obtained, a tentative numerical definition of the words matte, semi-matte, semi-gloss and glossy in numerical terms is given.

Action of Fuming Sulphuric Acid on Cast Iron and High Silicon Iron.—Apparatus, which is made of cast iron or high silicon iron and is used for the handling of fuming sulphuric acid, frequently cracks from no apparent cause. Heavy pipes, not subjected to any unusual strain, may crack longitudinally with a loud report. T. F. BANIGAN (*Jour. Ind. Eng. Chem.*, 1922, xiv, 323) has studied the prolonged action of fuming sulphuric acid, known as oleum or 103.37 per cent. sulphuric acid, on a high silicon iron alloy, on amorphous silicon, and on silicon carbide. Both the alloy and the silicon were attacked at room temperature with the production of silicon dioxide. The silicon carbide was not attacked even at a temperature of 100° C. Amorphous silicon was not attacked by 96 per cent. sulphuric acid acting for one week at a temperature of 100° C. Hence the sulphur trioxide in the fuming acid readily oxidizes silicon, either free or alloyed with iron. High silicon alloys are rapidly corroded by the fuming acid since the silicon is oxidized to voluminous silica (silicon dioxide), and a fresh surface is continually exposed. In cast iron and malleable iron, the sulphur trioxide penetrates the pores, oxidizes the silicon, and produces silica which occupies a larger volume than did the silicon from which it was derived. An internal strain is thereby created, and gives rise to failure of the apparatus. Apparently neither the silicon carbide nor the carbon in the casting has any action on the acid or any responsibility for the failure of the apparatus.

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