

The hardness test is a form of mechanical testing which depends on the mechanical properties of the material in a very complex and often unknown fashion, varying with different methods of hardness measurement. The hardness is associated with many mechanical properties of the material, and if these properties change so does the hardness. The principle properties of the material include the ductility, elasticity, tensile strength, impact strength, and so on. The hardness depends in a complicated way on the elastic modulus, elongation, and so forth. If these constants change, so must the hardness; if they remain constant, the hardness must follow suit. Thus a measurement of hardness enables us very simply to judge whether the mechanical properties of a body have changed under the influence of surface-active substances or not.

#### Hardness Measurements

In order to find whether surface-active substances had any effect or not, we measured the Brinell and Rockwell hardnesses of various metals in the dry state and with their surfaces wetted in various surface-active liquids. The test samples were made in the form of rectangular blocks .....mm in size. The samples were finished on a planing machine, ground on a plane grinder, and polished with "GOI" paste to a surface finish of..... . The measurements were made in complete agreement with the All-Union Standards for Brinell ~~hardness tests~~ (All-Union Standard 10241-40) and Rockwell (All-Union Standard 10242-40) hardness tests.