

API Gravity and Specific Gravity. Specific gravity and API (American Petroleum Institute) gravity are expressions of the density or weight of a unit volume of material. The specific gravity is the ratio of the weight of a unit volume of oil to the weight of the same volume of water at a standard temperature. Unless otherwise stated, both specific gravity and API gravity refer to these constants at 60°F. An exception is the use of 77°F (25°C) in connection with asphalts and road oils.

$$\text{Deg. API} = \frac{141.5}{\text{sp gr}} - 131.5 \quad \text{or} \quad \text{sp gr} = \frac{141.5}{\text{API} + 131.5} \quad (3-1)$$

Cloud and Pour Points. The cloud and pour points are useful in estimating the relative amount of wax in an oil. However, all oils will solidify if cooled to a low enough temperature, and hence these tests do not indicate the actual amount of wax or solid material in the oil. They do indicate that most of the wax, melting above the pour point, has been removed.

Characterization Factor. The most widely used index is the Characterization Factor of Watson, Nelson, and Murphy.⁴ It was originally defined as

$$K = \frac{\sqrt[3]{T_B}}{S} \quad (4-1)$$

in which T_B is the average molal boiling point (°F absolute) and S is the specific gravity at 60°F. It has since been related to viscosity, aniline