

**plate number,  $N$** 

**Also contains definitions of:** number of theoretical plates, theoretical plate number

*in chromatography*

A number indicative of column performance, calculated from the following equations which depend on the selection of the peak width expression:

$$N = \left(\frac{V_R}{\sigma}\right)^2 = \left(\frac{t_R}{\sigma}\right)^2$$

$$N = 16 \left(\frac{V_R}{w_b}\right)^2 = 16 \left(\frac{t_R}{w_b}\right)^2$$

$$N = 5.545 \left(\frac{V_R}{w_h}\right)^2 = 5.545 \left(\frac{t_R}{w_h}\right)^2$$

The value of 5.545 stands for  $8 \ln 2$ . These expressions assume a Gaussian (symmetrical) peak. In these expressions the units for the quantities inside the brackets must be consistent so that their ratio is dimensionless: i.e. if the numerator is a volume, then peak width must also be expressed in terms of volume. In former nomenclature the expressions 'number of theoretical plates' or 'theoretical plate number' were used for the same term. For simplification, the present name is suggested.

**Source:**

PAC, 1993, 65, 819 (*Nomenclature for chromatography (IUPAC Recommendations 1993)*) on page 847