surface excess, \( n^\sigma \)

For an interface, the adsorption or surface excess of a given component is defined as the difference between the amount of component actually present in the system, and that which would be present (in a reference system) if the bulk concentration in the adjoining phases were maintained up to a chosen geometrical dividing surface (Gibbs dividing surface). For a solid/liquid interface in which no component of the liquid phase penetrates into the solid, the surface excess (or adsorption) of component \( i \) is defined as:

\[
n_i^\sigma = n_i - V^l c_i^l
\]

where \( n_i \) is the total amount of \( i \) in the system, \( V^l \) is the volume of an arbitrarily chosen amount of bulk liquid (in the framework of the so-called algebraic method) and \( c_i^l \) is its bulk concentration in the liquid.

See: Gibbs adsorption

Source:
PAC, 1986, 58, 967 (Reporting data on adsorption from solution at the solid/solution interface (Recommendations 1986)) on page 969
Green Book, 2nd ed., p. 63