

Table 9.2 Different kinds of work that can be done by a system.

Type of work	Intensive variable	Extensive differential	Expression for work
General	force, F	change in distance, dr	$w = \int F dr$
Expansion	pressure, P	change in volume, dV	$w = \int P dV$
Electrical	voltage difference, ΔE	change in charge, dq	$w = \int \Delta E dq$
Surface	surface tension, γ	change in surface area, dA	$w = \int \gamma dA$
Stretching	tension, τ	change in length, dl	$w = \int \tau dl$
Chemical	chemical potential difference, $\Delta\mu$	change in number of moles of the molecule, dn	$w = \int \Delta\mu dn$

(Adapted from D.S. Eisenberg and D.M. Crothers, Physical Chemistry: With Applications to the Life Sciences. Menlo Park, CA: Benjamin/Cummings, 1979. With permission from Benjamin/Cummings.)