



#### ACROSS

- 1 A \_\_\_\_\_ process is a chemical reaction in which a system releases free energy and moves to a lower, more thermodynamically stable, energy state.
- 4 Le \_\_\_\_\_'s principle states that if a chemical system at equilibrium experiences a change in concentration, temperature, volume, or total pressure, the equilibrium will shift in order to partially counter-act the imposed change.
- 9 The entropy of \_\_\_\_\_ is the change in the entropy when two different chemical substances or components are mixed.
- 10 Chemical \_\_\_\_\_ is the mathematical study of the interrelation of heat and work with chemical reactions or with a physical change of state within the confines of the laws of thermodynamics.
- 11 A \_\_\_\_\_ equilibrium occurs when two reversible processes proceed at the same rate.
- 12 The term thermodynamic \_\_\_\_\_ energy is a measure of the amount of work that can be extracted from a system.
- 13 \_\_\_\_\_ in chemistry is a measure of how different molecules in a non-ideal gas or solution interact with each other, extending the idea of concentration to more complex systems.

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- 2 The \_\_\_\_\_ constant is the reaction quotient describing the state in which the chemical activities or concentrations of the reactants and products have no net change over time.
- 3 The reaction \_\_\_\_\_ is a quantitative measure of the extent of reaction, the relative proportion of products and reactants present in the reaction mixture at some instant of time.
- 5 A \_\_\_\_\_ reaction (also called an unfavorable reaction or a nonspontaneous reaction) is a chemical reaction in which the standard change in free energy is positive.
- 6 A \_\_\_\_\_ reaction is a chemical reaction where the variation of Gibbs free energy is negative.
- 7 An activity \_\_\_\_\_ is a factor used in thermodynamics to account for deviations from ideal behaviour in a mixture of chemical substances.
- 8 The \_\_\_\_\_ free energy is a thermodynamic potential which measures the useful or process-initiating work obtainable from an isothermal, isobaric thermodynamic system.