英汉翻译

练 习 二

1. **biochemical oxygen demand (BOD)** The amount of oxygen taken up by microorganisms that decompose organic waste matter in water. It is therefore used as a measure of the amount of certain types of organic pollutant in water. BOD is calculated by keeping a sample of water containing a known amount of oxygen for five days at 20℃. The oxygen content is measured again after this time. A high BOD indicates the presence of a large number of microorganisms, which suggests a high level of pollution.

2. **catalyst** A substance that increases the rate of a chemical reaction without itself undergoing any permanent chemical change. Catalysts that have the same phase as the reactants are homogeneous catalysts (e.g. enzymes in biochemical reactions or transition-metal complexes used in the liquid phase for catalysing organic reactions). Those that have a different phase are heterogeneous catalysts (e.g. metals or oxides used in many industrial gas reactions). The catalyst provides an alternative pathway by which the reaction can proceed, in which the activation energy is lower. It thus increases the rate at which the reaction comes to equilibrium, although it does not alter the position of the equilibrium. The catalyst itself takes part in the reaction and consequently may undergo physical change (e.g. conversion into powder). In certain circumstances, very small quantities of catalyst can speed up reactions. Most catalysts are also highly specific in the type of reaction they catalyze, particularly enzymes in biochemical reactions. Generally, the term is used for a substance that increase reaction rate (a positive catalyst). Some reactions can be slowed down by negative catalysts.

3. Physical chemistry, field of science that applies the laws of physics to elucidate the properties of chemical substances and clarify the characteristics of chemical phenomena. The term *physical chemistry* is usually applied to the study of the physical properties of substances, such as vapor pressure, surface tension, viscosity, refractive index, density, and crystallography, as well as to the study of the so-called classical aspects of the behavior of chemical systems, such as thermal properties, equilibria, rates of reactions, mechanisms of reactions, and ionization phenomena. In its more theoretical aspects, physical chemistry attempts to explain spectral properties of substances in terms of fundamental quantum theory; the interaction of energy with matter; the nature of chemical bonding; the relationships correlating the number and energy states of electrons in atoms and molecules with the observable properties shown by these systems; and the electrical, thermal, and mechanical effects of individual electrons and protons on solids and liquids.

4. The fundamental principles of chemical engineering underlie the operation of processes extending well beyond the boundaries of the chemical industry, and chemical engineers are employed in a range of operations outside traditional areas. Plastics, polymers, and synthetic fibres involve chemical reaction engineering problems in their manufacture, with fluid flow and heat transfer considerations dominating their fabrication. The dyeing of a fibre is a mass-transfer problem. Pulp and paper manufacture involve considerations of fluid flow and heat transfer. While the scale and materials are different, these again are found in modern continuous production of foodstuffs. The pharmaceuticals industry presents chemical engineering problems, the solutions of which have been essential to the availability of modern drugs. The nuclear industry makes similar demands on the chemical engineer, particularly for fuel manufacture and reprocessing. Chemical engineers are involved in many sectors of the metals processing industry, which extends from steel manufacture to separation of rare metals.

5. Because of the competitiveness within the chemical industry and among the chemicals, the chemical industry spends large amounts on research, particularly in the highly industrialized countries. The percentage of revenue spent on research varies from one branch to another; companies specializing in large-volume products that have been widely used for many years spend less, whereas competition in the newer fields can be met only by intensive research efforts.

6. Fossil fuels, including coal, petroleum and natural gas will continue to be the dominant domestic energy source for the foreseeable future, even as major efforts are being made to develop alternative energy supplies and to reduce demand by conservation measures. The challenges are to improve the efficiency of utilization of the fuels and to reduce the emissions of undesirable by-products during utilization.