

Chapter 3 Separation Processes Unit Operations

Mineral processing

Dewatering – solid/liquid separation. In all of these processes, the most important considerations are the economics of the processes, which is dictated by

Mineral processing is the process of separating commercially valuable minerals from their ores in the field of extractive metallurgy. Depending on the processes used in each instance, it is often referred to as ore dressing or ore milling.

Beneficiation is any process that improves (benefits) the economic value of the ore by removing the gangue minerals, which results in a higher grade product (ore concentrate) and a waste stream (tailings). There are many different types of beneficiation, with each step furthering the concentration of the original ore. Key is the concept of recovery, the mass (or equivalently molar) fraction of the valuable mineral (or metal) extracted from the ore and carried across to the concentrate.

Central processing unit

unit (ALU) that performs arithmetic and logic operations, processor registers that supply operands to the ALU and store the results of ALU operations

A central processing unit (CPU), also called a central processor, main processor, or just processor, is the primary processor in a given computer. Its electronic circuitry executes instructions of a computer program, such as arithmetic, logic, controlling, and input/output (I/O) operations. This role contrasts with that of external components, such as main memory and I/O circuitry, and specialized coprocessors such as graphics processing units (GPUs).

The form, design, and implementation of CPUs have changed over time, but their fundamental operation remains almost unchanged. Principal components of a CPU include the arithmetic-logic unit (ALU) that performs arithmetic and logic operations, processor registers that supply operands to the ALU and store the results of ALU operations, and a control...

Chemical engineering

hand, a unit process is the chemical equivalent of a unit operation. Along with unit operations, unit processes constitute a process operation. Unit processes

Chemical engineering is an engineering field which deals with the study of the operation and design of chemical plants as well as methods of improving production. Chemical engineers develop economical commercial processes to convert raw materials into useful products. Chemical engineering uses principles of chemistry, physics, mathematics, biology, and economics to efficiently use, produce, design, transport and transform energy and materials. The work of chemical engineers can range from the utilization of nanotechnology and nanomaterials in the laboratory to large-scale industrial processes that convert chemicals, raw materials, living cells, microorganisms, and energy into useful forms and products. Chemical engineers are involved in many aspects of plant design and operation, including...

Trump administration family separation policy

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The family separation policy under the first Trump administration was a controversial immigration enforcement strategy implemented in the United States from 2017 to 2018, aimed at deterring illegal immigration by separating migrant children from their parents or guardians. The policy, presented to the public as a "zero tolerance" approach, was intended to encourage tougher legislation and discourage unauthorized crossings. In some cases, families following the legal procedure to apply for asylum at official border crossings were also separated. Under the policy, federal authorities separated children and infants from parents or guardians with whom they had entered the U.S. The adults were prosecuted and held in federal jails or deported, and the children were placed under the supervision of...

Wastewater treatment

plants. One common process in wastewater treatment is phase separation, such as sedimentation. Biological and chemical processes such as oxidation are

Wastewater treatment is a process which removes and eliminates contaminants from wastewater. It thus converts it into an effluent that can be returned to the water cycle.

Once back in the water cycle, the effluent creates an acceptable impact on the environment. It is also possible to reuse it. This process is called water reclamation. The treatment process takes place in a wastewater treatment plant. There are several kinds of wastewater which are treated at the appropriate type of wastewater treatment plant. For domestic wastewater the treatment plant is called a Sewage Treatment. Municipal wastewater or sewage are other names for domestic wastewater. For industrial wastewater, treatment takes place in a separate Industrial wastewater treatment, or in a sewage treatment plant. In the latter...

Enriched uranium

of uranium-235 (written 235U) has been increased through the process of isotope separation. Naturally occurring uranium is composed of three major isotopes:

Enriched uranium is a type of uranium in which the percent composition of uranium-235 (written 235U) has been increased through the process of isotope separation. Naturally occurring uranium is composed of three major isotopes: uranium-238 (238U with 99.2732–99.2752% natural abundance), uranium-235 (235U, 0.7198–0.7210%), and uranium-234 (234U, 0.0049–0.0059%). 235U is the only nuclide existing in nature (in any appreciable amount) that is fissile with thermal neutrons.

Enriched uranium is a critical component for both civil nuclear power generation and military nuclear weapons. Low-enriched uranium (below 20% 235U) is necessary to operate light water reactors, which make up almost 90% of nuclear electricity generation. Highly enriched uranium (above 20% 235U) is used for the cores of many...

Unit testing

information hiding, encapsulation and the separation of concerns. To enable access to code not exposed in the external API, unit tests can be located in the same

Unit testing, a.k.a. component or module testing, is a form of software testing by which isolated source code is tested to validate expected behavior.

Unit testing describes tests that are run at the unit-level to contrast testing at the integration or system level.

FM 2-22.3 Human Intelligence Collector Operations

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Army Field Manual 2 22.3, or FM 2-22.3, Human Intelligence Collector Operations, was issued by the Department of the Army on September 6, 2006. The manual gives instructions on a range of issues, such as the structure, planning and management of human intelligence operations, the debriefing of soldiers, and the analysis of known relationships and map data. The largest and most newsworthy section of the document details procedures for the screening and interrogation of prisoners of war and unlawful combatants.

Centrifugal extractor

above, the mix & separation configuration is the standard operation for centrifugal contactors used for liquid-liquid extraction processes. The two liquids

A centrifugal extractor—also known as a centrifugal contactor or annular centrifugal

contactor—uses the rotation of the rotor inside a centrifuge to mix two immiscible liquids outside the rotor and to separate the liquids in the field of gravity inside the rotor. This way, a centrifugal extractor generates a continuous extraction from one liquid phase into another liquid phase.

A summary of contactor design principles and applications is included in a recent compilation.

Lamella clarifier

discharged to the environment. A separation process unit such as a coalescer is often used to physically trigger a separation of the water and the oils. For

A lamella clarifier or inclined plate settler (IPS) is a type of clarifier designed to remove particulates from liquids.

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