

TASK 1. MATCH THE DEFINITIONS.

Dispersion:	The process of combining two or more substances or materials together to create a homogeneous mixture, often achieved through mechanical agitation, stirring, or blending, to achieve desired properties or characteristics in the final product.
Agitation:	Distributing particles or droplets of one substance throughout another substance, often achieved through mixing and agitation.
Mixing:	Applying mechanical force or energy to a mixture to facilitate mixing, dispersion, or emulsification.

TASK 2. SOLVE THE CROSSWORD.

Mixing chamber Liquid medium Blade mixer Components
Unit operation Mechanical energy Power consumption
Heat transfer Shear forces Dispersion
Convective flow Final product

ACROSS:

1. a substance that is in liquid form and is used as a medium in mixing processes.
2. It is a distinct step or process within a larger operation.
3. A space or container where various substances are combined or blended together to create a uniform mixture.
4. The result of a mixing process.
5. Energy generated by the movement of mechanical components.

DOWN:

6. Process of spreading components evenly throughout a mixture.
7. Movement of fluid caused by temperature differences.
8. Equipment used to blend components together.
9. Forces that act parallel to each other, affecting the stability of a mixture.
10. Transfer of thermal energy between substances.
11. Measurement of the amount of energy used during mixing.

TASK 3. MATCH THE QUESTIONS (1-7) WITH THE APPROPRIATE RESPONSE (A-G).

1. _____ What is the primary objective of mixing as described in the text?
2. _____ How does mixing contribute to the reduction of nonuniformity in a system?
3. _____ What equipment is typically used to carry out mixing operations?
4. _____ What are the ultimate pieces into which components of a system are ideally dispersed during mixing?
5. _____ How does mixing promote mass and heat transfer, as well as chemical reactions?
6. _____ Why is evaluating the degree of mixing critical for assessing and controlling process performance and product quality?
7. _____ How do large interfacial areas between components influence the efficiency of mixing processes?

- a) *Mixing is typically carried out in equipment known as mixers.*
- b) *The primary objective of mixing, as described in the text, is to reduce the degree of nonuniformity of all properties of a system, single or multiphase, with one or many components.*
- c) *Large interfacial areas between components influence the efficiency of mixing processes by promoting mass and heat transfer as well as chemical reactions.*
- d) *Mixing promotes mass and heat transfer as well as chemical reactions by creating large interfacial areas between the components of a mixture.*
- e) *Evaluating the degree of mixing is critical for assessing and controlling process performance and ensuring product quality.*
- f) *The ultimate pieces into which components of a system are ideally dispersed during mixing may vary depending on the nature of the components and phases of the system. They could be the size of a molecule, a drop, a bubble, or a particle.*
- g) *Mixing contributes to the reduction of nonuniformity in a system by rearranging its components into a state where they are ideally uniformly distributed throughout the system and completely dispersed to their ultimate, smallest pieces.*

TASK 4. FILL IN THE GAPS WITH THE MOST SUITABLE WORD FROM THE BOX.

**FINAL PRODUCTS / DISPERSING / PRODUCT QUALITY /
CONSISTENCY / UNIFORMITY / REDUCE / HOMOGENEOUS /
HEAT TRANSFER / DEGREE OF MIXING**

- Mixing is a crucial process in various industries, involving the thorough blending of components to achieve _____ and consistency in properties throughout the mixture.
- The primary goal of mixing is to _____ nonuniformity within a system by _____ its components into smaller, evenly distributed pieces, promoting efficient mass and _____ as well as chemical reactions.
- Through mixing, raw materials are transformed into _____ blends, ensuring the desired quality and characteristics of the _____.
- Whether in food processing, pharmaceuticals, or manufacturing, the importance of mixing cannot be overstated, as it directly impacts the performance, quality, and _____ of end products.
- Evaluating the _____ achieved is critical for optimizing process performance, controlling _____, and meeting industry standards and regulations.

TASK 5. PUT THE STAGES OF THE MIXING PROCESS IN THE CORRECT ORDER.

_____ Activate the blade mixer to initiate the mixing process. The mechanical energy generated by the mixer will induce convective flow within the mixture, promoting the dispersion of components.

_____ Introduce the emulsifiers into the mixture to facilitate the dispersion of oil and water phases.

_____ Add the liquid medium, consisting of water and oils, into the mixing chamber.

_____ Gradually incorporate the fragrance into the mixture to ensure even distribution.

_____ Continuously assess the temperature within the mixing chamber to ensure optimal heat transfer throughout the process.

_____ Monitor the shear forces exerted on the mixture to prevent excessive agitation, which could affect the stability of the emulsion.

_____ Adjust the power consumption of the mixer as needed to maintain efficient mixing without excessive energy consumption.

_____ Begin by setting up the mixing chamber and ensuring all equipment is properly calibrated.

_____ Once the desired homogeneity is achieved, stop the mixer and transfer the final product for further processing or packaging.