

Pharmaceutical Amorphous Solid Dispersions

Pharmaceutical formulation 22 (2): 760–770. doi:10.1016/j.xpharm.2023.100000. Pharmaceutical formulation, in pharmaceuticals, is the process in which different chemical substances, including the active drug, are combined to produce a final medicinal product. The word formulation is often used in a way that includes dosage form. Molecular Pharmaceutics. Drug-Polymer Compatibility in Amorphous Solid Dispersions by MD Simulation: On the Trap of Solvation Free Energies; 3a02348998

Colloid dispersions, or hydrosols. The term colloidal suspension refers unambiguously to the overall mixture (although a narrower sense of the word suspension is distinguished from colloids by larger particle size). A colloid has a dispersed phase (the suspended particles) and a continuous phase (the medium of suspension). Some definitions specify that the particles must be dispersed in a liquid, while others extend the definition to include substances like aerosols and gels. Aerogel Jello cubes Colloidal silica gel with light opalescence Whipped cream A dollop of hair gel Creams are semi-solid emulsions A colloid is a mixture in which one substance consisting of microscopically dispersed insoluble particles is suspended throughout another substance 3a02348998

Glass Because it is often transparent and chemically inert, glass has found widespread practical, technological, and decorative use in window panes, tableware, and optics. Glass is an amorphous (non-crystalline) solid. Some common objects made of glass are named after the material, e. Because it is often transparent and chemically inert, glass has found widespread practical, technological Glass is an amorphous (non-crystalline) solid. g. , a "glass" for drinking, "glasses" for vision correction, and a "magnifying glass" 3a02348998

Sugar candy In British English, this broad category of sugar candies is called sweets, and the name candy or sugar-

Pharmaceutical Amorphous Solid Dispersions

candy is used only for hard candies that are nearly solid sugar. because they can have a grainy texture. Amorphous sugar candies have only one phase, which is either solid or liquid, and do not have a grainy texture Sugar candy is any candy whose primary ingredient is sugar. The main types of sugar candies are hard candies, fondants, caramels, jellies, and nougats 3a02348998

Glass is most often formed by rapid cooling (quenching) of the molten form. Some glasses such as volcanic glass are naturally occurring, and obsidian has been used to make arrowheads and knives since the Stone Age. Archaeological evidence suggests glassmaking dates back to at least 3600 BC in Mesopotamia, Egypt, or Syria. The earliest known glass objects were beads, perhaps created accidentally during metalworking or the production... 3a02348998

Amorphous solid Preparation Process for Amorphous Solid Dispersions Via Noninvasive Imaging Analytics and Material Characterization". The terms "glass" and "glassy solid" are sometimes used synonymously with amorphous solid; however, these terms refer specifically to amorphous materials that undergo a glass transition. Examples of amorphous solids include glasses, metallic glasses, and certain types of plastics and polymers. Pharmaceutical Research. 39 (12): 3137–3154 In condensed matter physics and materials science, an amorphous solid (or non-crystalline solid) is a solid that lacks the long-range order that is a characteristic of a crystal 3a02348998

Two liquids can form different types of emulsions. As an example, oil and water can form, first, an oil-in-water emulsion, in which the oil is the dispersed phase... 3a02348998 The main engineering strategies currently in use are hydrogen- and halogen bonding and coordination bonding. These may be understood with key concepts such as the supramolecular synthon and the secondary building unit. 3a02348998 All spray dryers use some type of atomizer or spray nozzle to disperse the liquid or slurry into a controlled drop size spray. The most common of these are rotary disk and single-fluid high pressure swirl nozzles. Atomizer wheels are known to provide broader particle size distribution, but both methods allow for consistent distribution of... 3a02348998

Crystal engineering It is an interdisciplinary academic field, bridging solid-state and supramolecular chemistry. Crystal

Pharmaceutical Amorphous Solid Dispersions

engineering studies the design and synthesis of solid-state structures with desired properties through deliberate control of intermolecular interactions Crystal engineering studies the design and synthesis of solid-state structures with desired properties through deliberate control of intermolecular interactions 3a02348998

Emulsion Examples of emulsions include vinaigrettes, homogenized milk, liquid biomolecular condensates, and some cutting fluids for metal working. In an emulsion, one liquid (the dispersed phase) is dispersed in the other (the continuous phase). Emulsions are part of a more general class of two-phase systems of matter called colloids. Emulsions are used to manufacture polymer dispersions – polymer production in an emulsion ‐phase‐; has a number of process advantages An emulsion is a mixture of two or more liquids that are normally immiscible (unmixable or unblendable) owing to liquid-liquid phase separation. Although the terms colloid and emulsion are sometimes used interchangeably, emulsion more narrowly refers to when both phases, dispersed and continuous, are liquids. achieve vapor mitigation 3a02348998

Surface energy While this is only strictly true for amorphous solids (glass) and liquids, isotropy is a good approximation for many other In surface science, surface energy (also interfacial free energy or surface free energy) quantifies the disruption of intermolecular bonds that occurs when a surface is created. crystallographic orientations. Another way to view the surface energy is to relate it to the work required to cut a bulk sample, creating two surfaces. In solid-state physics, surfaces must be intrinsically less energetically favorable than the bulk of the material (that is, the atoms on the surface must have more energy than the atoms in the bulk), otherwise there would be a driving force for surfaces to be created, removing the bulk of the material by sublimation. The surface energy may therefore be defined as the excess energy at the surface of a material compared to the bulk, or it is the work required to build an area of a particular surface 3a02348998

Since the definition of a colloid is so ambiguous, the International Union of Pure and Applied Chemistry (IUPAC) formalized a modern definition of colloids: "The term colloidal refers to a state of subdivision... 3a02348998

Pharmaceutical Amorphous Solid Dispersions

Spray drying This is the preferred method of drying of many thermally-sensitive materials such as foods and pharmaceuticals, or materials which may require extremely consistent, fine particle size. In pharmaceutical manufacturing, spray drying is employed to manufacture Amorphous Solid Dispersions, by uniformly dispersing Active Pharmaceutical Ingredients. Spray drying is a method of forming a dry powder from a liquid or slurry by rapidly drying with a hot gas. Air is most commonly used as the heated drying medium; however, nitrogen may be used if the liquid is flammable (such as ethanol) or if the product is oxygen-sensitive. 3a02348998

Melt electrospinning Since volatile solvents are not used, there are benefits for some applications where solvent toxicity and accumulation during manufacturing are a concern. formulation technique in the field of pharmaceutical technology to prepare amorphous solid dispersions or solid solutions with enhanced or controlled. Melt electrospinning is a processing technique to produce fibrous structures from polymer melts for applications that include tissue engineering, textiles and filtration. In general, electrospinning can be performed using either polymer melts or polymer solutions. However, melt electrospinning is distinct in that the collection of the fiber can be very focused; combined with moving collectors, melt electrospinning writing is a way to perform 3D printing. 3a02348998

Sugar candy is a sub-type of candy, which includes sugar candies as well as chocolates, chewing gum and other sweet foods. Candy, in turn, is a sub-type of confectionery, which also includes sweet pastries and sometimes ice cream. 3a02348998

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