

Prüfungsfragenkatalog für Grundlagen der AST Präformulierung (Prof. Oliver Werzer)

Stand: Juni 2019

Termin: 04.06.2019 -> Die unterstrichenen Begriffe/Sätze sind die Lösung.

1. Computed tomography data collection → on which linear _____ coefficient? -absorption
2. BET-Theory: Adsorption of gas molecules at solids
3. For a material that does not increase its weight (or moisture) when stored at high humidity is a non-hygroscopic material.
4. A smectic phase is associated with a liquid crystalline phase.
5. One of the thermal analysis techniques is based on the measurement of weight loss heating. The technique is named by the acronym TGA which stands for thermal gravimetric analysis.
6. The preformulation studies involve chemical, physical and mechanical properties in order to choose what other ingredients should be used in the preparation and to develop a stable, safe and effective dosage form.
7. pH of the body:
 - Stomach pH: smaller 7
 - Skin pH: smaller 7
 - Bloods pH: larger 7
 - Saliva typically pH: equal 7
 - pH intestine region: larger 7
8. pKa of 9.0. Such a pKa means that it behaves like a weak acid.
9. Assuming that the pKa is larger than the pH it means that the level of ionization is larger than 50%.
10. Within a medication the amount of drug is reduced due to the occurrence of chemical reactions. As the shelf life is not reached yet it can be assumed that less than X% of the drug changed. X=10%
11. By the addition of a specific salt to a solution containing proteins a cloud point formation is absent, but which was present at the very same thermodynamic conditions before. Therefore, one can conclude that this salt results in a salting in.
12. As the shear rate increases a decrease in the viscosity is apparent. Such a behavior is associated with a so-called shear thinning.
13. The Bragg equation is a simple form to understand the appearance of diffraction intensities at given angles. If a net-plane distance (d1) is measured at a small angle and another (d2) is measured at large angle, this means that...? – d1 is larger than d2
14. Polymorphism-statements:
 - Different polymorphs possess different solubilities
 - Each polymorph requires an individual registration
 - Compact capabilities differ for each polymorph
15. An amorphous solid state in general dissolves differently to its crystalline counterpart. The reason is:
 - The energy required to dissolve a molecule from the amorphous state is lower.
16. When preparing a tablet, it is important that the materials involved show plastic deformation.
17. Using permeation assays is a good way to estimate for human intestinal adsorption. Hereby an increase in assay complexity typically results in the correction being: -better
18. For the investigation of thermal properties often a differential scanning calorimeter is used.
19. The process in which vacant surface sites are occupied by molecules is named adsorption.
20. The arrangement of atoms in a unit cell can be experimentally determined. Therefore, experiments are performed which use electromagnetic radiation. The wavelength best suited for this purpose is in the regions of x-ray.
21. When the amount of surfactant molecules reaches the maximum at the water-air interface, the so-called "cmc" is reached. Hereby cmc is the abbreviation for the critical micelle concentration.
22. In the pharmaceutical science, buffers are often used. The reason/s for this is/are:
 - pH value remains in a certain range over the course of the experiment.
 - Buffer solution tries to mimic/simulate the living organism.
23. How does the solubility in terms of mM/m³ change as the molecular weight of a solute decreases? – the solubility increases
24. In the United States Pharmacopeia, the solubility is classified from very soluble down to practically insoluble. From which quantities their classifications are derived?
 - It indicates how much solvent molecules are required to dissolve one drug molecule.

25. When a medication is administered intravenously, how high is its bio-availability per definition? Numbers from 0-100%? – 100%
26. The underlying process for a substance or a solid form to dissolve is based on diffusion. Which following statements are correct?
 - The viscosity of the surrounding medium affects dissolution rates.
 - Using a sufficient large amount of dissolution medium is terms of achieving sink conditions, the dissolution will not be significantly limited by a reduction of the concentration gradient over the course of the experiment.
 - The Noyes-Whitney equation provide information on the amount of mass dissolved over time rather than providing information on the change in concentration in the surrounding over time.

Termin: 25.04.2017 – 17 Fragen

1. Distribution Faktor Log __
2. Definition preformulation: chemical, physical, mechanical
3. Allopurinol hat einen pKa von 9 und ist (Antwortmöglichkeiten):
 - very strong acid
 - strong acid
 - weak acid
4. Shear thinning
5. Solubility abhängig von (Antwortmöglichkeiten):
 - temperature
 - pressure
 - pH
 - ...
6. Seeding: einmal große Kerne, einmal kleine Kerne, eine Reaktion ist schneller als die andere. Wieso? (Antwortmöglichkeiten):
 - polymorphic structure
 - temperature was low
 - surface area larger
7. Additioning salt to.... ->salt in oder salt out
8. PH Werte von:
 - Saliva, Blood, intestinal, skin, stomach
9. Pka > pH. Was bedeutet das? (Antwortmöglichkeiten): >50% =50% <50%
10. D1 kleiner Winkel, d2 großer Winkel. D1 ist _____ als d2. - Antwort zum reinschreiben. (smaller, bigger, smaller equal, bigger equal)
11. Preformulation in which stage? Which number? (Antwort: candidate drug screening, 2)
12. Diffusion Aussagen zum ankreuzen
13. Solubility parameter

Termin: 07.04.2017

1. Paracetamol pKa = pH der Umgebung → wv. % ist ionisiert
2. partitioning coefficient, bezeichnung durch: log P
3. X-ray defraction: mit welchen Parametern kann man netplane berechnen
angle +?
4. Bioverfügbarkeit bei intravenöser Medikation (100)
5. Unterschied Dissoziationsgeschwindigkeit Reaktion erster und nullter Ordnung
wenn nach 33min bei beiden 53% des Medikaments gelöst worden sind
6. shelf life, wieviel % des Wirkstoff müssen noch mindestens übrig sein
7. in welcher der 7 Entwicklungsphasen eines Medikaments wird die Präformulierung vollzogen (2. => candidate drug screening)
8. Verwendungszweck eines Puffers in der (pharmazeutischen) Chemie
9. Definition Präformulierung: mechanische, chemische & physikalische Stabilität
10. US Pharmacopedia: durch welche Faktoren wird die solubility definiert
11. welche(r) Faktor(en) beeinflussen Löslichkeit (mol/V)
(Auswahlmöglichkeiten: Druck, pKa, pH, solvent class, temperature)
12. Aspirin pKa 3,49 → strong acid
13. shear stress ↑ & viscosity ↓ → shear thinning

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14. Cloud point formation: salting _____

15. mM/m³ Molekulargewicht sinkt Einfluss auf Dissoziation (?) Antwortmöglichkeiten: bleibt gleich, wird schlechter, wird besser