

CH 114 Learning Objectives, Chapter Summaries and Study Guide for Exam #1

Introduction to Forensic Chemistry; after completing this section you should be able to:

Define and distinguish forensic science and criminalistics

Recognize the major contributors to the development of forensic science

Describe two possible factors contributing to the rapid growth of forensic labs in the past four decades

Describe the services of a typical comprehensive crime lab as well as other specialized services available to law enforcement personnel

Compare and contrast the Frye and Daubert decisions relating to the admissibility of scientific evidence in the courtroom

Explain the roles and responsibilities of the expert witness

Define and explain the importance of Locard's exchange principle to forensics

Physical Properties: Glass and Soil; after completing this section you should be able to:

Define and distinguish the physical and chemical properties of matter

Use the basic units of the metric system including prefixes to convert between units of measurement and measurement systems

Define and understand the properties of density and refractive index and their use in forensics

Do density calculations

Describe forensic methods for comparing glass fragments

Compare and contrast radial and concentric glass fractures

Determine the direction of impact for a projectile by examining glass fractures; 3R rule

List the important forensic properties of soil

Describe forensic methods for comparing soil samples

Describe the proper collection of glass and soil samples evidence

Organic Analysis; after completing this section you should be able to:

Define and distinguish between elements and compounds

Explain how solids, liquids and gases are alike and how they are different

Distinguish between organic and inorganic compounds

Explain the difference between qualitative and quantitative analysis and give examples from lab

Describe and explain the process of chromatography

Explain the differences between thin-layer chromatography, gas chromatography and electrophoresis

Describe the differences between the wave and particle theories of light

Describe the electromagnetic spectrum

Explain how are ultraviolet and infrared spectroscopy are used to identify organic compounds

Explain how mass-spectroscopy is used for identification analysis

Inorganic Analysis; after completing this section you should be able to:

Describe the usefulness of trace elements in the forensic analysis of physical evidence

Explain how a continuous emission spectrum differs from a line spectrum

Understand atomic structure including what are protons, neutrons and electrons, where each is found, and the significance of each particle

Explain how atomic number and atomic mass number differ from each other

Use a periodic table to determine atomic number and identify elements

Write nuclide symbols

Identify metals, nonmetals, alkali metals, alkaline earth metals, transition metal, halogen and noble gases on a periodic table

Explain how an atom absorbs and releases energy in the form of light

Define and identify isotopes

Describe what makes an element radioactive

Describe how x-ray diffraction be used to chemically identify an unknown

Explain the ICP process and applications of ICP in forensics