

XPRD, EXAFS, and SAXS for CHARACTERIZATION of NANOPARTICLES for PHARMACOLOGY

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Application of x-ray probing for pharmaceutical research and testing has been dramatically increasing in recent years.

Different types of structural disorder and their fingerprints will be discussed. The offered discussion will accelerate expected changes in API physical and pharmacology properties. Detection limit of x-ray methods was developed to envelope low levels of crystalline material (colloid size Ag nano - clusters) in liquid matrix (water).

Restrictions on the use of x-ray methods has been arrived and demands understanding.

Both x-ray diffraction and EXAFS spectroscopy are non-destructive methods that require no sample preparation, thus allowing samples to be analyzed easily and on-line keeping them in their natural condition.

This work presents the development of a joint instrument called “MAXIM – 2” consisting of x-ray diffraction and EXAFS spectroscopy separated lines for executive characterizing.

Firstly using Rigaku rotation anode x-ray source there was realized coupled device:

EXAFS spectrometer and SAXS spectrometer by using two outlet windows.

All three measurements (EXAFS spectrum, x-ray diffraction and optical imaging) can be performed rapidly. These techniques are friendly. They possess one to have the system information on the complicated structure of a sample. The chain of suggested and realized methods gives the information about

- structural,
- electron,
- atomic

condition of a matter.

Micro-XPRD, optical microscopy, and SAXS were used to study the nanoclusters of Ag and the effect of penetration ability of nanopores in the biological membranes for zooblast, macrocyte, red blood cells, etc.