Physics of materials

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1. Structure and chemical composition and their influence on physicochemical properties of materials:

a) main groups of materials (1h);

b) crystalline and amorphous materials (1h);

c) quasicrystals and liquid crystals (1h);

d) relation between structural features (e.g. packing density, coordination number, symmetry) and properties of materials (2h);

2. Static and dynamical imperfections in materials:

a) point and electron defects (1h);

b) line and surface defects (1h);

c) relation between structural defects and properties of materials (2h);

d) atom vibrations and thermal properties of materials (1h);

3. Electronic properties of materials:

a) dielectrics (1h);

b) electronic conductors and semiconductors (1h);

c) ionic conductors (1h);

d) do dielectrics, conductors and semiconductors really differ one from another? (1h)

4. Summary. What is new in the world of materials? (1h)

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