



NEW TECHNOLOGY OF PRODUCTION "SOLAR" SILICON WITH INCREASED ELECTROPHYSICAL PROPERTIES

The technology provides:

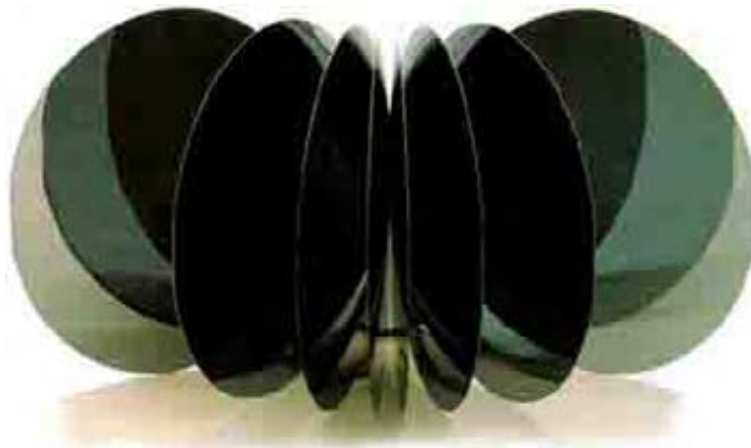
- increase of "solar" silicon monocrystals life-time of nonbasic charge bearers (τ_{NCB}) from 18,4 μs up to 228 μs at the expense of purposeful alloying;
- additional increase of "solar" silicon plates life-time of nonbasic charge bearers (τ_{NCB}) in 1,5-2 times in comparison with monocrystals at the expense of heat-treatment;
- increase of "solar" batteries efficiency up to 21 %.

Developed:

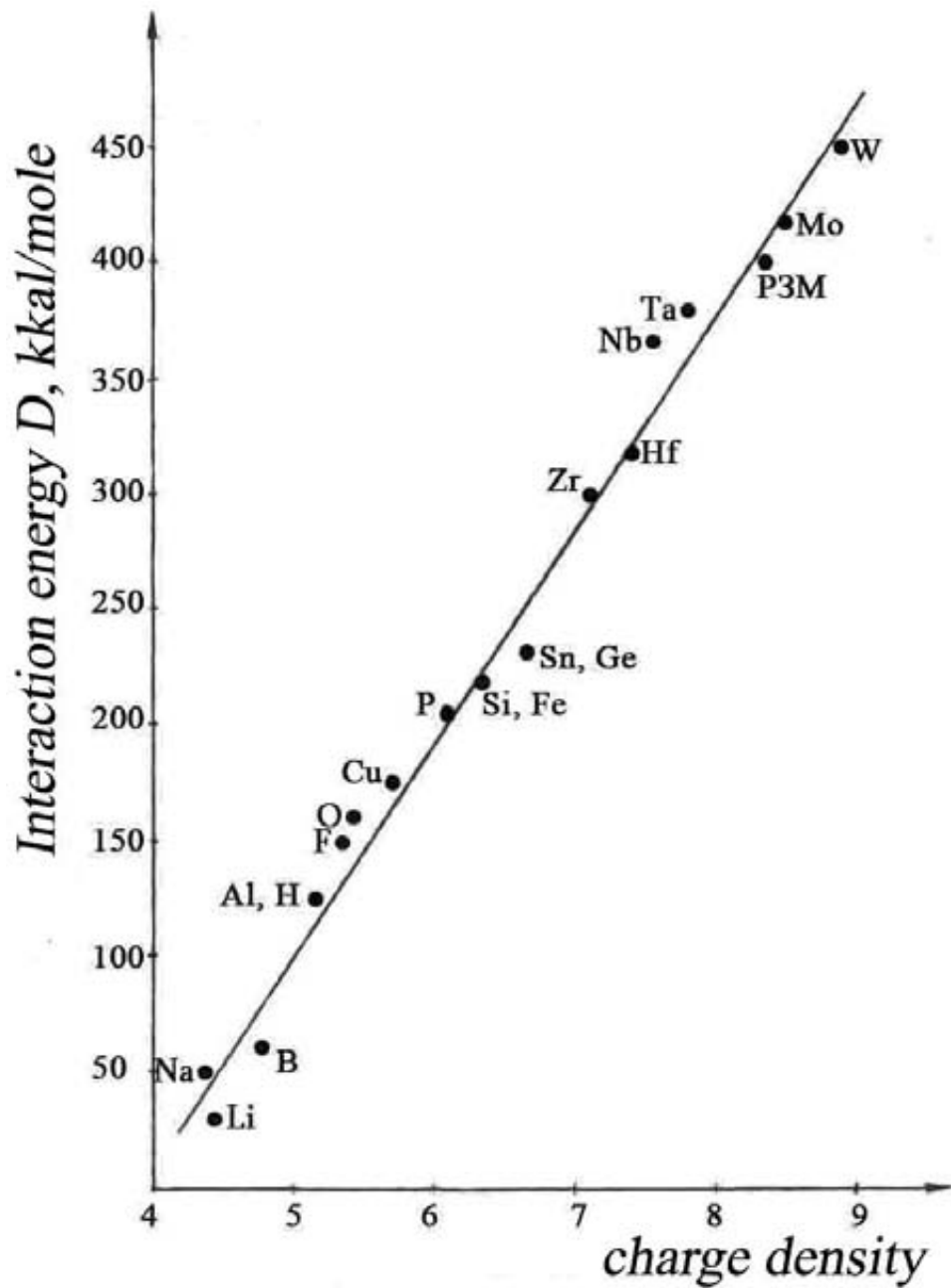
- physicochemical modelling technique for selection effective alloying elements for semiconductor silicon, which considers a change of interaction energy of silicon atoms in the crystal lattice;
- choice of temperatures, heating-cooling speed under technological procedures (impurities diffusion, gettering, annealing) was carried out with purpose to avoid phase transformations in silicon, formation defect structure and electrophysical properties degradation;
- regims for heat-treatment of monocrystals and alloyed silicon plates, taking into account the temperatures of phase transformations.



Monocrystal of semiconductor "solar" silicon



Planes of semiconductor "solar" silicon



Alloying elements effect on the interaction energy of silicon atoms in the crystal lattice