Open Question to Point Defects

Von G.F. Cerofolini (1989):

Having recently written a book on physical chemistry of, in and on silicon [1], I have considered some of the most obvious queries which could be raised when considering such a topic, viz.:

- which is the atomic configuration of point defects? (e.g., is the self- interstitial quasi free or does it have a dumb-bell configuration?)
- 2. has each defect only one configuration or are several configurations possible?
- 3. which is the electronic structure?
- 4. which charge states are associated with each defect and where are they located in the gap?
- 5. can the defect be actually considered pointlike (i.e., do the remaining atoms remain on their lattice location) or does the deformation extend to long range?
- 6. does an entropic or enthalpic barrier exist for Frenkel-pair recombination?
- 7. which are the defect diffusivities in relation to their charge states?
- 8. is the surface an effective generation-recombination centre for point defects?
- 9. to which extent does this generation-recombination rate depend on surface conditions (free, oxidated, nitridated, etc.)?

Most of them, however, remained unanswered.