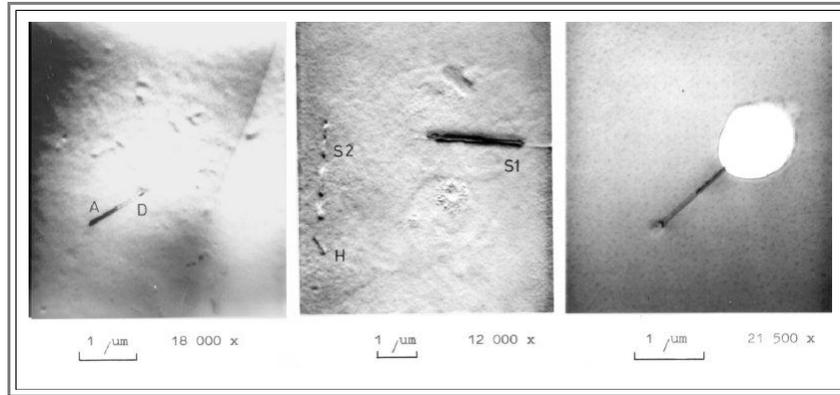


Iron Precipitates in Si Integrated Circuits

Illustration

- Iron is a major contaminant in integrated circuits because there is a lot of steel in contact with the wafers or with materials needed to process a wafer.
- Iron atoms diffuse as interstitials; they are [rather mobile](#). Since the solubility at low temperatures is low, there is a strong tendency for agglomeration. The small iron silicide precipitates in turn serve as nucleation centers for large defects, especially the huge oxidation induced stacking faults.
- An iron concentration of well below **1 ppb** thus may enough to kill all integrated circuits in the thus "contaminated" part of a wafer.



- The defects shown are almost certainly **FeSi₂** precipitates, which often occur in "needle-shape". Some stacking fault and dislocation dipole components may also be involved. These needles are already very large; the defects labelled "H" may be a smaller needle.