

EE128 Homework Set 1

Question 1:

You are designing a Si solar cell system that will be used to visit Superman's parents. Given that the planet Superman's parents live on has red sun sunlight the AR coating needs to be $0.1850\mu\text{m}$. Design a thermal oxidation process that will create a SiO_2 AR coating on Silicon. Assume that the minimum furnace time step is 20minutes.

Question 2:

Design a diffusion process that will create a p/n junction on P-type Silicon doped to $5 \times 10^{16} \text{cm}^{-3}$ with Boron to have junction depth of $0.25\mu\text{m}$. Assume that the minimum furnace time step is 20minutes.

Question 3:

You are a process engineer and are trying to develop a process that will create a SiO_2 AR coating on Silicon that will be $0.1\mu\text{m}$ thick. The recipe you have selected is a wet oxide process on $\langle 111 \rangle$ Si for 1150°C for 1.56 minutes. You have noticed that the oxide thickness is not uniform at all after fabrication.

What do you think the problem is?

What is the solution?