

# Department of Materials and Metallurgical Engineering

## South Dakota School of Mines and Technology

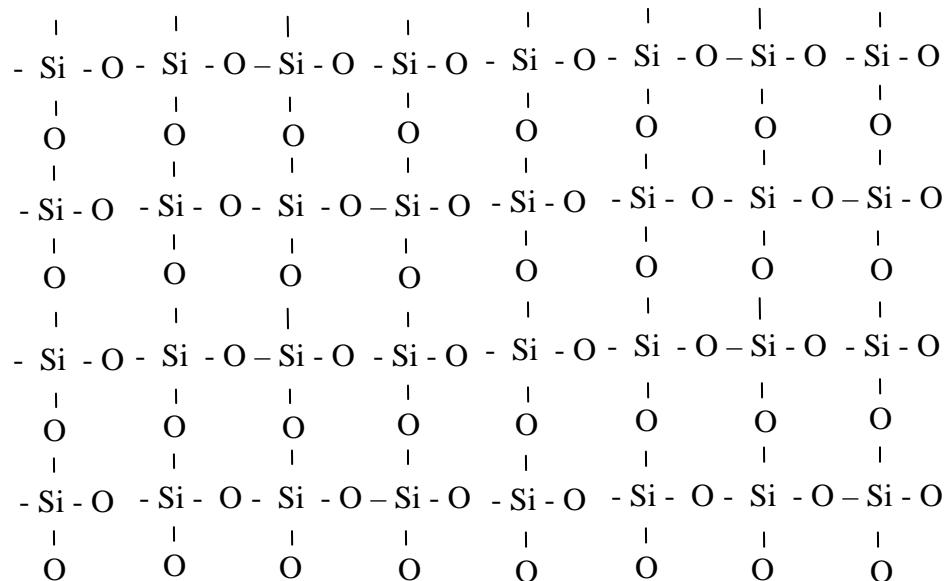
### Slag Information

- Acid slags require acid refractories
- Basic slags require basic refractories
- Use basic slags to remove acidic impurities. This means P in steelmaking.
- Use acidic slags to remove basic impurities. Not so important since the driving force (Gibbs energy) for oxidation of basic components is typically very favorable.
- Acid slags are viscous because of the silica network.
- Basic slags are fluid because they are ionic.
- Basic flux added to an acid slag snips the silica network into smaller pieces thereby making it more fluid.
- Acid flux added to a basic slag lowers its melting point to workable temperatures.

In order of Decreasing Basicity – Less O<sup>2-</sup> (Decreasing ionic bond fraction)

- Basic components: Na<sub>2</sub>O, BaO, SrO, CaO
- Neutral components: MnO, FeO, ZnO, MgO, BeO, Cr<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>3</sub>
- Acidic components: SiO<sub>2</sub>, P<sub>2</sub>O<sub>5</sub>

### The Silica Network:



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**The Silica Network Fluxed with CaO:**

