SELECTIVE ETCHING OF UNREACTED NICKEL AFTER SALICIDATION
ABSTRACT

A method for removing unreacted nickel or cobalt after silicidation using carbon monoxide dry stripping is described. Shallow trench isolation regions are formed in a semiconductor substrate surrounding and electrically isolating an active area from other active areas. A gate electrode and associated source and drain regions are formed in the active area wherein dielectric spacers are formed on sidewalls of the gate electrode. A nickel or cobalt layer is deposited over the gate electrode and associated source and drain regions, shallow trench isolation regions, and dielectric spacers. The semiconductor substrate is annealed whereby the nickel or cobalt layer overlying the gate electrode and said source and drain regions is transformed into a nickel or cobalt silicide layer and wherein the nickel or cobalt layer overlying the dielectric spacers and the shallow trench isolation regions is unreacted. The unreacted nickel or cobalt layer is exposed to a plasma containing carbon monoxide gas wherein the carbon monoxide gas reacts with the unreacted nickel or cobalt thereby removing the unreacted nickel or cobalt from the substrate to complete salicidation of the integrated circuit device.

Figure 2