

ABSTRACT OF THE DISCLOSURE

APPARATUS AND METHOD FOR REMOVAL OF SURFACE OXIDES VIA FLUXLESS TECHNIQUE INVOLVING ELECTRON ATTACHMENT

5

Described herein is a method and apparatus for removing metal oxides on a surface of a component via electron attachment. In one embodiment, there is provided a field emission apparatus, wherein the electrons attach to at least a portion of the reducing gas to form a negatively charged atomic ions which removes metal oxides comprising: a
10 cathode comprising an electrically conductive and comprising at least one or more protrusions having an angled edge or high curvature surface, wherein the cathode is surrounded by a dielectric material which is then surrounded by an electrically conductive anode wherein the cathode and anode are each connected to an electrical voltage source, and the dielectric material between the cathode and anode is polarized,
15 intensifying the electrical field strength and accumulating electrons at the apex of the cathode to promote field emission of electrons from the cathode.

FIG. 1