

**APPARATUS AND METHOD WHICH REDUCE THE EROSION RATE OF SURFACES
EXPOSED TO HALOGEN-CONTAINING PLASMAS**

1 [0092] **ABSTRACT OF THE DISCLOSURE**

2 [0093] A ceramic article which is resistant to erosion by halogen-containing
3 plasmas used in semiconductor processing. The ceramic article includes ceramic which
4 is multi-phased, typically including two phases to three phases. In a first embodiment,
5 the ceramic is formed from yttrium oxide at a molar concentration ranging from about 50
6 mole % to about 75 mole %; zirconium oxide at a molar concentration ranging from
7 about 10 mole % to about 30 mole %; and at least one other component, selected from the
8 group consisting of aluminum oxide, hafnium oxide, scandium oxide, neodymium oxide,
9 niobium oxide, samarium oxide, ytterbium oxide, erbium oxide, cerium oxide, and
10 combinations thereof, at a molar concentration ranging from about 10 mole % to about 30
11 mole %. In a second embodiment, the ceramic article includes ceramic which is formed
12 from yttrium oxide at a molar concentration ranging from about 90 mole % to about 70
13 mole % and zirconium oxide at a molar concentration ranging from about 10 mole % to
14 about 30 mole %, , wherein a mean grain size of said ceramic ranges from about 2 μm to
15 about 8 μm . In a third embodiment, the ceramic article includes ceramic which is formed
16 from zirconium oxide at a molar concentration ranging from about 96 mole % to about 94
17 mole %, and yttrium oxide at a molar concentration ranging from about 4 mole % to
18 about 6 mole %.

Figure 2C