and/or abrasive particles from the slurry may adhere to the abrading surface of the pad conditioner. This phenomena reduces the pad conditioner's ability to remove the glaze from the polishing pad and/or expose new polishing pad surface and ultimately leads to reduced polishing performance of the polishing pad itself. To improve this situation, a pad conditioner is needed that has an abrading surface that reduces swarf build-up and/or can be easily cleaned of swarf.

The present disclosure relates to abrasive articles having a unique hydrophilic surface. The hydrophilic surface improves wettability of the abrasive article's surface and may lead to enhanced anti-fouling capabilities and/or enhanced cleaning capabilities due to the hydrophilic surface of the abrasive article. This contrasts with prior art, e.g. U.S. Pat. Appl. Publ. 2011/0053479 (Kim et al.), which suggests that hydrophobic cutting surfaces are required to prevent contamination of a cutting tool surface, e.g. a pad conditioner surface. The present disclosure also provides polishing systems that incorporate the abrasive articles of the present disclosure.

The present disclosure provides an abrasive article comprising:

a ceramic body having an abrading surface and an opposed second surface, wherein the abrading surface of the ceramic body includes a plurality of engineered features each having a base and a distal end opposite the base and the ceramic body has a Mohs hardness of at least 7.5 and/or a Vickers hardness of at least 1300 kg/mm^2;

a conformable metal oxide coating adjacent to and conforming to the plurality of engineered features, wherein the conformable metal oxide coating includes a first surface; and

a conformable polar organic-metallic coating in contact with the first surface of the conformable metal oxide coating.

In one aspect, the present disclosure provides an abrasive article comprising:

a ceramic body having an abrading surface and an opposed second surface, wherein the abrading surface of the ceramic body includes a plurality of engineered features each having a base and a distal end opposite the base and the ceramic body has a Mohs hardness of at least 7.5;

a conformable metal oxide coating adjacent to and conforming to the plurality of engineered features, wherein the conformable metal oxide coating includes a first surface; and

a conformable polar organic-metallic coating in contact with the first surface of the conformable metal oxide coating, wherein the conformable polar organic-metallic coating includes a chemical compound having at least one metal and an organic moiety having at least one polar functional group.

In some examples, the conformable polar organic-metallic coating includes a chemical compound having at least one metal and an organic moiety having at least one polar functional group. Optionally, the at least one metal of the conformable polar organic-metallic coating may be at least one of Si, Ti, Zr and Al. The ceramic body may have a thickness between from 4 mm to 25 mm. In some embodiments, the projected surface area of the abrading surface is between from 500 mm^2 to 500000 mm^2.

In another aspect, the present disclosure provides a polishing system comprising:

a polishing pad including a material;

What is claimed is:

1. An abrasive article comprising:

a ceramic body having an abrading surface and an opposed second surface, wherein the abrading surface of the ceramic body includes a plurality of engineered features each having a base and a distal end opposite the base and the ceramic body has a Mohs hardness of at least 7.5;

a conformable metal oxide coating adjacent to and conforming to the plurality of engineered features, wherein the conformable metal oxide coating includes a first surface; and

a conformable polar organic-metallic coating in contact with the first surface of the conformable metal oxide coating, wherein the conformable polar organic-metallic coating includes a chemical compound having at least one metal and an organic moiety having at least one polar functional group.

2. The abrasive article of claim 1, wherein the at least one metal of the conformable polar organic-metallic coating is at least one of Si, Ti, Zr and Al.

3. The abrasive article of claim 1, wherein the at least one polar functional group includes at least one of a hydroxyl, an acid, a primary amine, a secondary amine, a tertiary amine, a methoxy, an ethoxy, a propoxy, a ketone, a cationic and an anionic functional group.

4. The abrasive article of claim 1, wherein the at least one polar functional group includes at least one of a cationic functional group and an anionic functional group.

5. The abrasive article of claim 1, wherein the at least one polar functional group includes at least one cationic functional group and one anionic functional group.

6. The abrasive article of claim 1, wherein the chemical compound is an organosilane and wherein the conformable polar organic-metallic coating includes the reaction product of the organosilane and the metal oxide of the conformable metal oxide coating.

7. The abrasive article of claim 6, wherein the organosilane includes at least one of an organochlorosilane, organosilanol and an alkoxysilane.

8. The abrasive article of claim 1, wherein the organosilane includes an alkoxysilane.

9. The abrasive article of claim 1, wherein organosilane includes at least one of n-trimethoxysilylpropyl-n,n,n-trimethylammonium chloride, n-(trimethoxysilylpropyl)ethylenediaminetriacetate trisodium salt, carboxyethylsilanetriol disodium salt, 3-(trihydroxysilyl)-1-propanesulfonic acid and n-(3-triethoxysilylpropyl)gluconamide.

10. The abrasive article of claim 1, wherein the conformable polar organic-metallic coating further includes at least one of lithium silicate, sodium silicate and potassium silicate.

11. The abrasive article of claim 1, wherein the contact angle of water on the conformable polar organic-metallic coating is between from 0 degrees to 20 degrees.

12. The abrasive article of claim 1, wherein the ceramic body is a carbide ceramic body and includes 99% carbide ceramic by weight.

13. The abrasive article of claim 12, wherein the carbide ceramic body includes 99% silicon carbide ceramic by weight.

14. The abrasive article of claim 12, wherein the ceramic body is a monolithic ceramic body.

15. The abrasive article of claim 1, wherein the plurality of engineered features are precisely shaped features.

16. A polishing system comprising:

a polishing pad including a material;

a pad conditioner having an abrading surface, wherein the pad conditioner includes at least one abrasive article of claim 1, wherein the abrading surface of the pad conditioner includes the conformable polar organic-metallic coating of the at least one abrasive article.

17. The polishing system of claim 16, wherein the material of the polishing pad includes polyurethane.

18. The polishing system of claim 16, wherein the working liquid is an aqueous, working liquid.