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**Cold plasma processing of biochar using point-to-point corona discharge in atmospheric pressure dry air** SHUZHENG XIE, PATRICK PEDROW, KARL ENGLUND, Washington State Univ — Cold plasma generated from a gas admixture of helium and dry air with 60 Hz AC voltage at 6.5 kV RMS was utilized to process biochar. We expect reactive oxygen and nitrogen species (RONS) to be generated in the cold plasma and that these chemical radicals will modify the biochar. Processed samples are immersed in distilled water after which the pH of the solid/water mixture is measured. pH analysis shows processed samples/water admixture has lower pH, indicating plasma process introduces more acidic group to the biochar. After pH analysis the solid biochar granules are reclaimed from solution and the solute is evaluated for carbon and nitrogen content resulting from material leaching into the distilled water. FTIR spectra are measured for dry samples of biochar before and after immersion in the distilled water. Experimental results indicate that new oxygen- and nitrogen- containing functional groups have been introduced to the surface of the samples. Our current hypothesis is that the cold plasma processing converts recalcitrant biochar mass into labile biochar mass, resulting in and enhanced amount of water-extractable carbon.

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