

Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Nonthermal Plasma Polymerization Coating on Aramid Surfaces for Durable Omniphobicity¹ ESHRAGA A.A SIDDIG, New Energy Material and Device, College of Science, Donghua University, Shanghai 201620, Peoples Republic of China, JING ZHANG TEAM, JIANJUN SHI TEAM, TIANSHU WANG COLLABORATION, BAOJING YANG COLLABORATION, YU XU TEAM — Durable superomniphobic textiles, including self-cleaning, protective clothing, and liquid separation, are beneficial for their practical applications. Nonthermal plasma polymerization of environmentally friendly C6 fluorine was coated, and a durable omniphobic aramid fabric was achieved. The fabric became water and oil repellent with an elevated static water contact angle of ($>170^\circ$). As tested by the water spray AATCC test and hydrocarbon resistance test, the as-prepared fabric gained 100(ISO5) and grade number 4 respectively. Compared to directly coated aramid fabric, its water contact angle remained stable above 170° , and its AATCC water/oil repellent separately was two grades higher after 10 washing cycles display improved washing durability. Surface techniques indicated that the durable superomniphobicity can be related to the plasma introduction of reactive polar groups like $\text{O}=\text{C}-\text{O}$ on the fibre surface, which induces more adsorption and chemical graft of the C6 copolymer. -keywords Nonthermal plasma polymerization; Aramid fabric; Superomniphobicity; Washing durability

¹National Natural Science Foundation of China (No.11375042)

Eshrag
New Energy Material and Device, College of Science, Donghua University, Shanghai 201620, Peoples Republic of China

Date submitted: 15 Jun 2020

Electronic form version 1.4