Supplementary Material

Aluminum nanoparticles manufactured by ball-milling method using ammonium chloride as a grinding aid: achieving energy release at low temperature.

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Fig. S1 Cold welding photograph of aluminum powders ball milled for 14 h without using NH_4Cl.

Section 2. SEM images of aluminum particles.

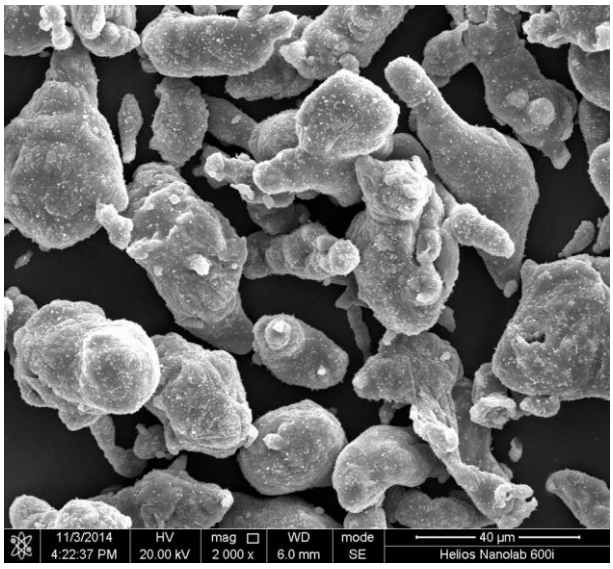

Fig. S2 SEM image of raw micron aluminum powders.

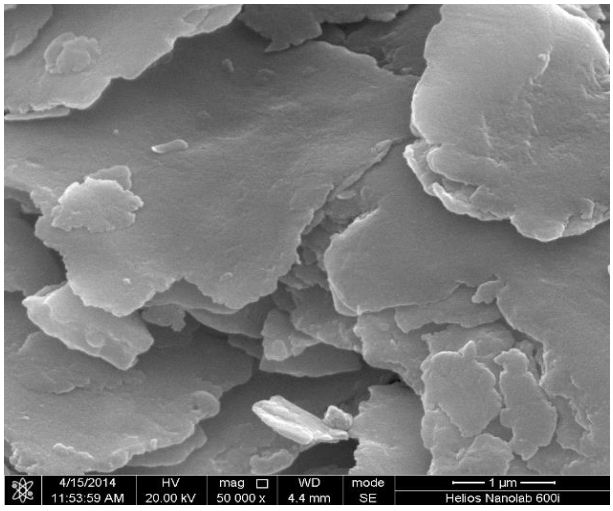

Fig. S3 SEM image of aluminum particles ball milled for 2 h.

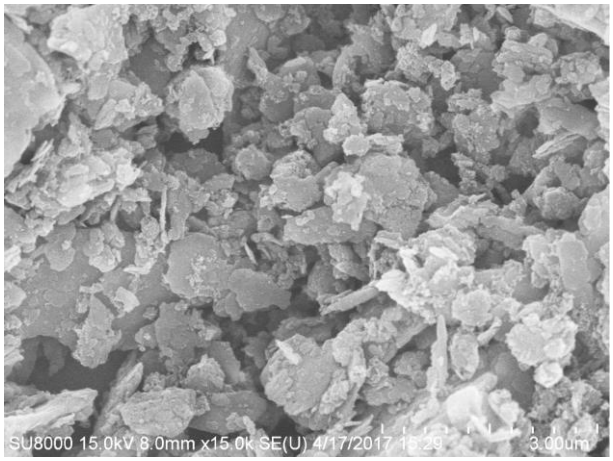

Fig. S4 SEM image of aluminum particles ball milled for 4 h.

Section 3. Photographs of unpassivated and passivated aluminum nanoparticles.

Fig. S5 Photograph of bare aluminum particles ball milled for 14 h in the open air atmosphere.

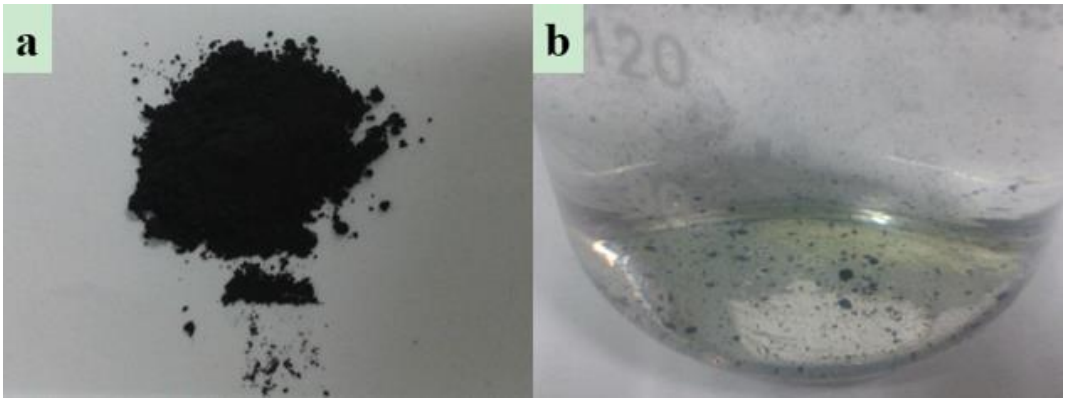

Fig. S6 (a) Photograph of passivated aluminum particles ball milled for 14 h in the open air atmosphere; (b) photograph of passivated aluminum particles ball milled for 14 h in water.

Section 4. The zoomed-in XRD patterns of aluminum nanoparticles and micron aluminum powders.

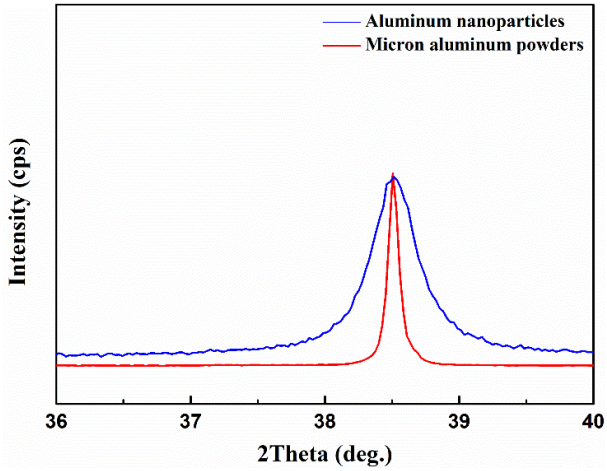

Fig. S7 The corresponding zoomed-in XRD patterns for (111) planes of passivated aluminum nanoparticles and micron aluminum in the regions 36-40°.

Section 5. IR spectra of aluminum (III) acetylacetonate and passivated aluminum nanoparticles.

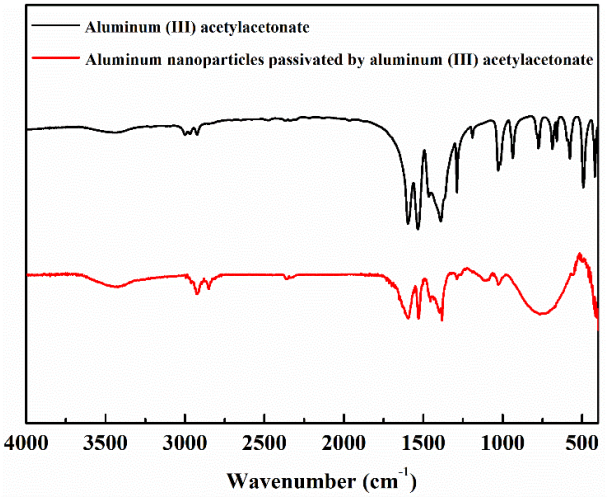

Fig. S8 Infrared spectra of aluminum (III) acetylacetonate and passivated aluminum nanoparticles.

Section 6. EPR spectra of unpassivated and passivated aluminum nanoparticles.

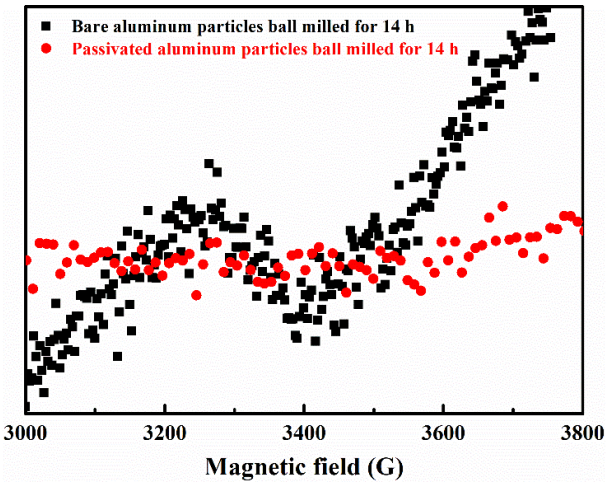

Fig. S9 EPR spectra of bare aluminum particles ball milled for 14 h and passivated aluminum particles ball milled for 14 h.