

Supporting Information-

Balancing strength and ductility in Al matrix composites reinforced by few-layered MoS₂ through in-situ formation of interfacial Al₁₂Mo

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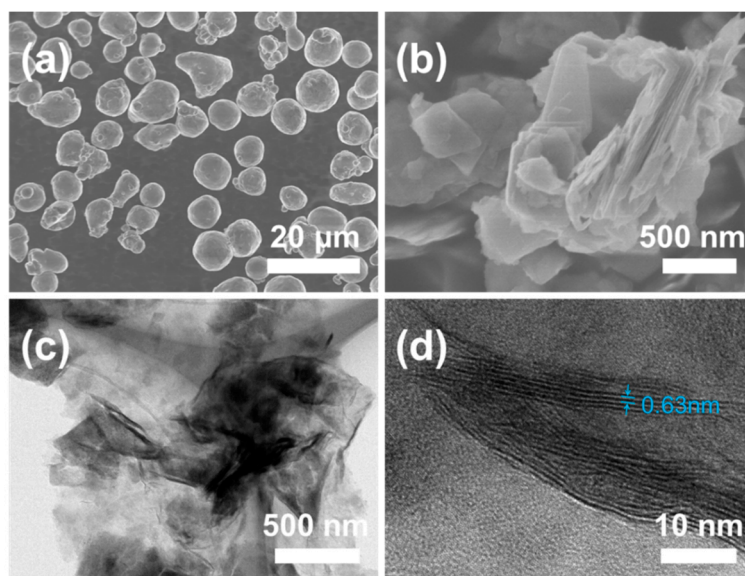


Figure S1. Morphology of the raw materials in the present work. (a) SEM image of raw Al powders; (b) SEM image of bulk crystal MoS₂; (c-d) TEM image of FLM

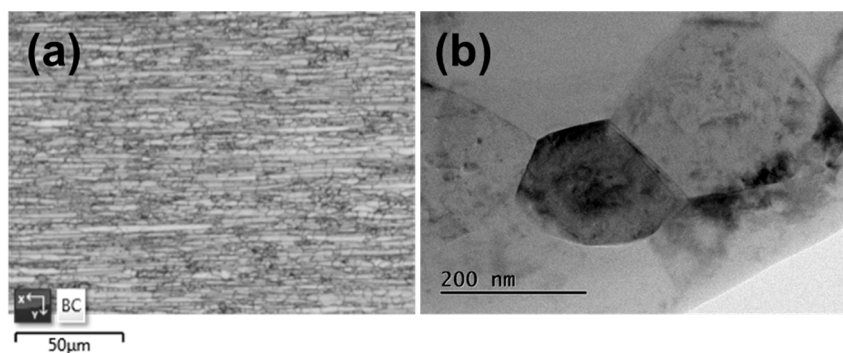


Figure S2. (a) The diffraction contrast diagram of pure Al and (b) TEM image of composites.

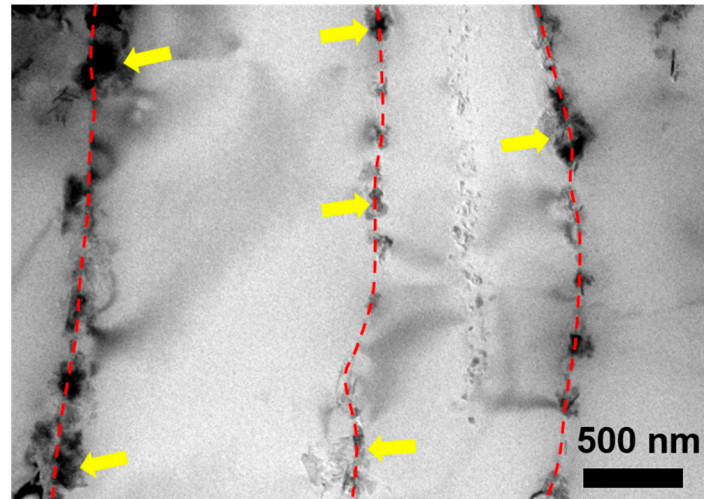


Fig. S3. TEM image of FLM distributed in Al grain boundaries

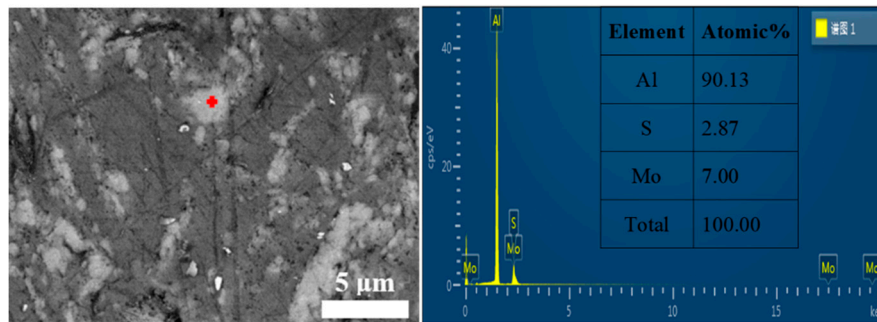


Figure S4. EDS results of 10 wt.% bulk crystal MoS₂-Al composite at 630 °C

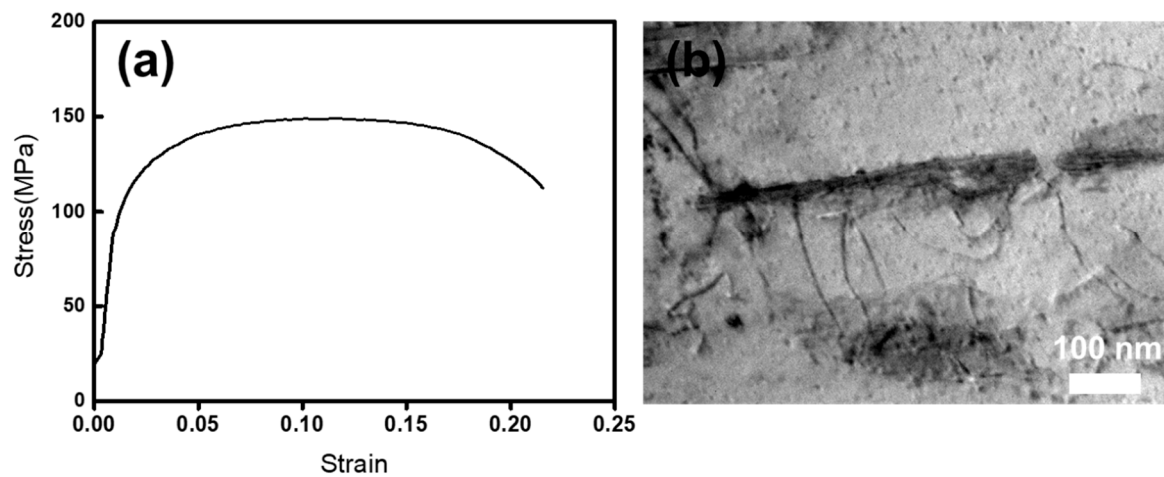


Figure S5. (a) Tensile curve; (b) TEM image of 1.5 wt. %FLM/Al composite at 550 °C

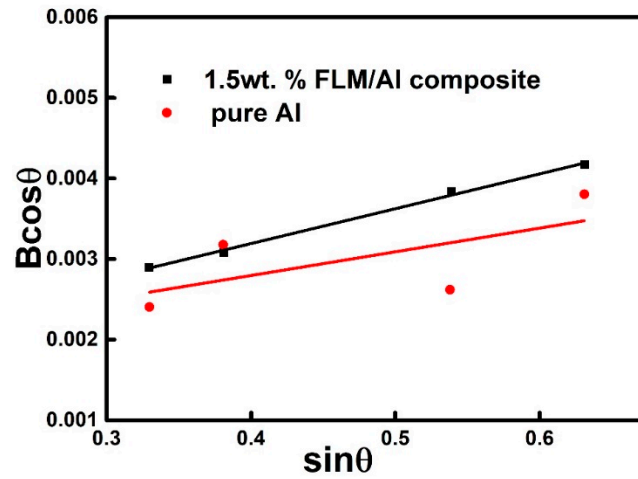


Figure S6. Typical W-H plots of composite and pure Al **sintered at 630 °C** samples after tensile deformation

Table S1 Vickers Hardness of bulk samples sintered at 630 °C

Sample type	Pure Al	0.5 wt. %FLM-Al	1.0 wt. %FLM-Al	1.5 wt. %FLM-Al
HV	46 ± 1.5	52 ± 0.5	57 ± 2.0	72 ± 1.5

Table S2. Calculated results of composite and pure Al samples after deformation by W-H method

Sample type	ε (slope)	$k\lambda/d$ (intercept)	ρ (dislocation density, 10^{14}m^{-2})
Pure Al	0.00294	0.00162	4.16
1.5 wt. %FLM-Al composite	0.00432	0.00146	5.51