

Supplementary material



Fig. S1. (Color online) Fabrication process of Al-5083/Mg, Sr, SiC composites: heating of matrix and reinforcements using stir casting (a), pouring of molten metal into mold (b), solidified and labeled composite specimens (c).



Fig. S2. (Color online) Sr, Mg, and SiC particles.



Fig. S3. (Color online) 4% Specimen samples.



Fig. S4. (Color online) Tensile testing: 2% wt.% specimen.

Table S1. Image-based microstructural features extracted from the 4 wt.% reinforced composite (descriptive metrics only)

Feature Type	Extracted Value (4 wt.%)	Description / Interpretation
Particle Count	188 particles	Number of segmented reinforcement particles in selected SEM region
Average Particle Area	123.1 μm^2 (approx.)	Apparent mean particle area from image segmentation
Area Fraction	2.30%	Percentage of reinforcement-rich regions in the analyzed image
Distribution Uniformity	Moderate-High	Qualitative assessment based on spatial dispersion

Note: The values reported in Table S1 are descriptive metrics extracted from a single SEM micrograph and are not used to draw statistical correlations or predictive relationships with mechanical properties.