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Influence of nanodispersions on corrosion behaviour of aluminum metal matrix nanocomposites fabricated using powder metallurgy route

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The corrosion behaviour of Al/SiC and Al/Al₂O₃ metal matrix nanocomposites (MMNCs) using electrochemical measurements in 3.5 wt.% NaCl solution were studied. Several Al MMNCs containing different sizes, typically, 60 nm and 200 nm and different volume fractions of SiC and Al₂O₃ nanoparticulates were manufactured using conventional powder metallurgy (PM) route. The results revealed that the corrosion rates of the 60 nm Al/SiC and Al₂O₃ nanocomposites in 3.5 wt.-% NaCl solution was reduced with increasing the volume fraction of the nanoparticulates. The Al/5 vol.-% SiC (200 nm) nanocomposites exhibited the lowest corrosion resistance among all the investigated materials even the pure Al matrix. The Al/SiC nanocomposites exhibited better corrosion resistance in 3.5 wt.% NaCl solution than the Al/Al₂O₃ nanocomposites.

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