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**Formation of Intermetallic-lined Microchannels in Sintered Metals by
Local Reactive Infiltration**

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A novel method for fabricating microchannels in metal bodies was proposed, and its feasibility was experimentally investigated using transition metals. In the experiments, a transition-metal powder compact including shaped aluminum wire was sintered at a temperature above the melting point of aluminum. Ni, Ti, Fe, Cr and SUS304 stainless steel was used as the transition metal. The diameter of the aluminum wire varied from 50 to 500 μm . Microscopic reactive infiltration of molten aluminum into the surrounding transition-metal powder occurred during the sintering, and brought about the formation of microchannels lined with intermetallic compounds in the sintered body. Using very thin aluminum wires in the nickel and the iron specimens and decreasing the heating rate in the sintering process leads to the formation of thick intermetallic phases that obstruct the microchannels. In this case, the aluminum wire should be melted rapidly.