



Symposia Summary

Wettability and Interfacial Phenomena between Metals and Ceramic/Refractory Materials

Organizers: Martin Pech-Canul (Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional), Zariff Chaudhury (Materion Corporation), Golam Newaz (Wayne State University)

While the success of a number of important technological applications depends on the wetting of certain solids by liquid metals and alloys, in some cases, the wetting of the solid by the liquid metal is undesired. Moreover, a reactive form of wetting may lead to the formation of either beneficial or deleterious reaction products. For instance, wettability plays a key role in certain processing routes for MMCs, such as the pressureless infiltration technique. The wettability parameters—i.e., contact angle and interfacial energies—depend on a number of factors including the solid and liquid chemistry, temperature, thermal history, atmosphere type, contact time, solid surface condition, etc. Failure in the control of such parameters may lead to weak interfaces with the consequent low mechanical properties of the material. By contrast, in the non-ferrous industry, particularly in the copper and lead smelting furnaces the working lining made of magnesia-chromite bricks, wetting is to be avoided because of the chemical attack that causes corrosion. A third topic involved the wetting and wicking behavior of refractory coatings used in lost foam castings. Results from studies of diffusion bonding between Ti_3SiC_2 and NiTi shape memory alloys were also presented in the session, showing a high fracture toughness of the interfacial bonding phase.

The papers presented at this symposium can be categorized within the previously mentioned topics, and the short but enlightening session was characterized by the enthusiasm of attendants during the question-and-answer session. In conclusion, all the papers presented showed interesting results within the context of standard scientific and technological content, and the expectations of the organizers were thoroughly met. Likewise, we hope that the expectations of the authors were fulfilled satisfactorily. As a final point, the organizers are grateful to the authors and attendees for their participation and look forward to seeing all of them in future symposia.

—Submitted by *Martin Pech-Canul*