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Neil Epstein* (nepstein@math.uos.de), Albrechtstrasse 28a, 49076 Osnabrueck, Germany, and
Yongwei Yao (yyao@gsu.edu), 30 Pryor St., Atlanta, GA 30303. *Criteria for flatness and injectivity.*

Let R be a commutative Noetherian ring. We develop equivalent criteria for a module to be flat in terms of torsion-freeness of certain tensor products. We also develop equivalent criteria for a module to be injective in terms of divisibility of certain Hom modules. These criteria are at their cleanest when R is reduced, although they are not limited to such a circumstance. Connections with Grothendieck's *local flatness criterion* are also explored. As an application, we give equivalent criteria for a Noetherian (local) ring of prime characteristic to be regular. (Received January 26, 2010)