1024-13-53 **Jay Shapiro*** (jshapiro@gmu.edu), Department of Mathematics, George Mason University, Fairfax, VA 22030. *Irreducibility in the total ring of quotients.*

Let R be a ring whose total ring of quotients Q is von Neumann regular. Generalizing the work in [L. Fuchs, W. Heinzer, and B. Olberding, Commutative ideal theory without finiteness conditions: irreducibilty in the quotient field, Abelian groups, rings, modules, and homological algebra, 121–145, Lect. Notes Pure Appl. Math., 249], we investigate the structure of R when it admits an ideal that is irreducible as a submodule of the total ring of quotients. In particular, we characterize those rings which contain a maximal ideal that is irreducible in Q the total ring of quotients of R. It has been shown that an integral domain has a Q-irreducible ideal which is a maximal ideal if and only if R is a valuation domain. We show that when the total ring of quotients of R is von Neumann regular, then having a maximal ideal that is Q-irreducible is equivalently to a valuation like property. This property in turn is equivalent to, among other things, R being a pullback of the form $Q \times_{Q/P} V$, where Q is a von Neumann regular ring, $P \in \mathrm{Spec}(Q)$ and Q/P is the quotient field of the valuation ring V. (Received December 15, 2006)