

1046-16-420

Gary F. Birkenmeier, Barbara L. Osofsky* (osofsky@math.rutgers.edu), **Jae Keol Park**
and **S. Tariq Rizvi**. *Properties of injective hulls of a ring having a compatible ring structure*. Preliminary report.

The injective hull $E(R_R)$ of a ring R has a unique structure as a ring whose multiplication is compatible with R -module multiplication if $E(R_R)$ is a rational extension of R_R . There are known examples where such a compatible ring structure exists when $E(R_R)$ is not a rational extension of R_R , and other examples where such a compatible ring structure on $E(R_R)$ cannot exist. We discuss several examples, and then study the case where R is an Artin algebra. For example, if R is an Artin algebra, then $E(R_R)$ has a set theoretically unique structure as a ring whose multiplication is compatible with R -module multiplication iff $E(R_R)$ is a rational extension of R_R ; if such a structure exists, then $E(R_R)$ is a quasiFrobenius ring under it. We also consider the question in the Artin algebra case of whether such a ring structure is unique up to isomorphism, and when it might exist. (Received September 01, 2008)