

On infinite direct sums of lifting modules

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Abstract

© 2017 World Scientific Publishing Company The aim of the present article is to investigate the structure of rings (R) satisfying the condition: for any family (M_i) of simple right (R) -modules, every essential extension of (M) is a direct sum of lifting modules, where (M) denotes the injective hull. We show that every essential extension of (M) is a direct sum of lifting modules if and only if (R) is right Noetherian and (M) is hollow. Assume that (M) is an injective right (R) -module with essential socle. We also prove that if every essential extension of (M) is a direct sum of lifting modules, then (R) is (M) -injective. As a consequence of this observation, we show that (R) is a right V-ring and every essential extension of (M) is a direct sum of lifting modules for all simple modules (M_i) if and only if (R) is a right (M) -V-ring.

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Keywords

(M) -injective module, (M) -lifting module, (M) -V-ring, H-ring, Hollow module, lifting module, Noetherian ring, QF-ring