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**James Lewis\*** (j12826@cornell.edu). *Factorization in The Monoid of Integrally Closed Ideals*. Preliminary report.

Given a Noetherian ring  $A$ , the collection of all integrally closed ideals in  $A$  which contain a nonzerodivisor, denoted  $ic(A)$ , forms a cancellative monoid under the operation  $I * J = \overline{IJ}$ , the integral closure of the product. The monoid is torsion-free and atomic – every integrally closed ideal in  $A$  containing a nonzerodivisor can be factored in this  $*$ -product into  $*$ -simple integrally closed ideals. Restricting to the case where  $A$  is a polynomial ring and the ideals in question are monomial, we show that there is a surjective homomorphism from the Integral Polytope Group onto the Grothendieck group of integrally closed monomial ideals under translation invariance of their Newton Polyhedra. Notably, the Integral Polytope Group, the Grothendieck group of polytopes with integer vertices under Minkowski addition and translation invariance, has an explicit basis, allowing for explicit factoring in the monoid. (Received August 20, 2021)