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CONSERVATION OF MATTER IN COMPLEX CHEMICAL MECHANISMS

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This paper aims at putting forward a unified theory of mass conservation. In addition to mass conservativity and related properties of complex chemical mechanisms, we introduce a new system of concepts, which can be regarded as dual to the old one. After reviewing previous results (with proofs and examples) on mass conservativity, we give necessary and/or sufficient conditions that are simpler or easier to handle, as well as algorithms for checking mass conservativity. Based on a general alternative theorem for linear inequalities, we prove results connecting the two systems of concepts.