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Miguel A. Mendez* (mmendezenator@gmail.com), Calle 39-18 #35, Apartamento 301, Bogotá, Cundinamar 111311, Colombia. *C-Monoids in Species and Posets*.

In the category of set species we review three monoidal operations, 1) Substitution 2) Product 3) Arithmetic product

They give rise to three monoidal categories. The first one is related to the substitution of formal power series, the second to the ordinary product, and the third to the product of Dirichlet series. Monoids with respect to the substitution are operads. Monoids with respect to the product are called ordinary monoids (closely related to associative algebras). The third one leads to a new kind of monoids that we call of Dirichlet type. In each of the three monoidal categories, monoids that satisfy a left cancellation law are called c-monoids. The c-monoids are important because interesting families of partially ordered sets can be constructed from them in a very natural way. Cohen-Macaulay property for posets associated to c-monoids in the first and second monoidal categories are respectively equivalent to the Koszul property of the corresponding operad or associative algebra. We explore Koszulness versus Cohen-Macaulay property in the Dirichlet case. (Received September 13, 2016)