Abstract

An ever-increasing pressure on resources and environmental protection, especially in CO2 reduction [1], lead to "a systemic change in the use and recovery of resources in the economy" through a clearly transition to a regenerative circular economy [2,3] by creating a close-loop system, minimizing the use of resource inputs and the creation of wastes, pollution and carbon emissions [3]. Therefore, a new potential pathway in innovation and investment, eliminating wastes and the continual use of resources has been proposed. From this perspective the reuse of an opportunely re-refined end of life oils from automotive industry, [4,5] that have become unfit for the use for which they were originally intended, produced by the Itelyum Regeneration srl [6] completely fulfil the Circular Economy goals. By using a refining technology called Revivoil the company can produce, through a final treatment with a catalytic hydrogenation at high pressure, named as Hydrofinishing, three different types of refined high value base oils with API Group II characteristics [4,5], gasoil and a less valuable bitumen product (marketed as Viscoflex 1000® and Viscoflex 2000®). Nowadays, the latter is used mainly as a bitumen additive or bituminous membrane production. However, in the view of a circular economy and taking into account the opportunity to reduce as much as possible the crude oil extraction, an interesting project has been started between University of Calabria [7], University of Bologna [8] and Itelyum Regeneration aimed to increase the Viscoflex properties by using additives (chemical e/o natural). Moreover, the additives themselves derive from other waste sources (e.g. end of life tyres, waste papers, etc.) and produce a new higher performing bituminous binder [9] with flexible and specific applications by tuning rheological and mechanical properties to satisfy the Italian National requirements and or International ones and to be employed directly in asphalt mixtures production.

Biography

Michele Porto is currently a PhD student at the Chemistry Department of University of Calabria. He gained his master degree in 2017 working on Mean Field Models applied to Biaxial Nematic liquid crystals. He is author/co-author of 5 papers on international peer reviewed journals. Actually, he is working on recycling of waste materials, mainly from industrial production, trying to obtain new bituminous binders for asphalt production

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