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Antioxidant and DPPH (1,1-diphenyl-2-picrylhydrazyl) Free Radical Scavenging Activities of Boniger Acid and Calix[4]arene Derivative

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Diazonium derivative of calix[4]arene has been synthesized using three different synthetic steps. Initially p-*tert*-butylcalix[4]arene was synthesized with the condensation reaction of p-*tert*-butylphenol and formaldehyde in basic conditions. Calix[4]arene was obtained after the debutylation reaction of p-*tert*-butylcalix[4]arene with $AlCl_3$. Calix[4]arene reacted with diazonium salt of Böniger acid to yield the 5,17-[(Bis(azo)-bis(5-hydroxy-2,7-naphthalenedisulfonicacid)]-25,26,27,28-tetrahydroxy calix[4]arene which has eight free phenolic hydroxyl group. Reaction steps were shown in Fig.1.

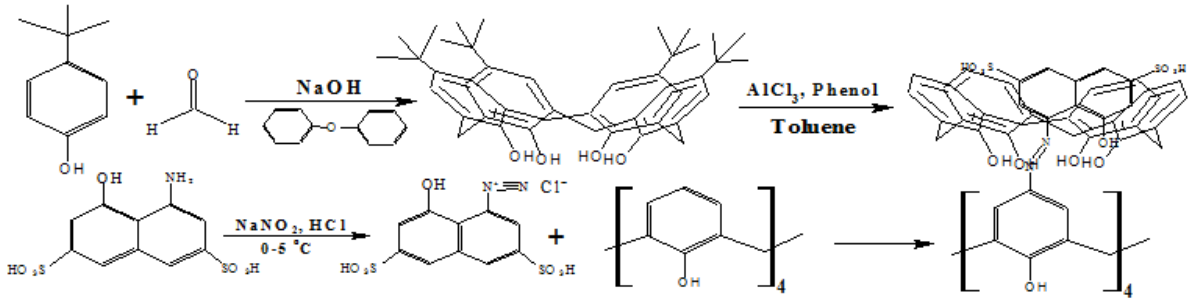

Figure 1. Synthesis of diazonium derivative of 5,17-[(Bis(azo)-bis(5-hydroxy-

2,7-naphthalenedisulfonicacid)]-25,26,27,28-tetrahydroxy calix[4]arene The antioxidant activity of the Böniger acid and calix[4]aren derivative were determined using β-karotene-linoleic acid system. Moreover, the free radical scavenging activity values were tested with DPPH free radical. The two compounds showed strong antioxidant activity. Total antioxidant activity of Böniger acid and calix[4]aren derivative was determined using β–carotenelinoleic acid model system and was found the antioxidant activity of 84.00% and 85.60 % respectively. The free radical scavenging activities were determined as 83.05% and 84.69 %. Results show that, two compounds has the antioxidant activity. The calix[4]aren derivaties has more higher activity then Boniger acid because of calix[4]aren derivative has much hydroxl groups.

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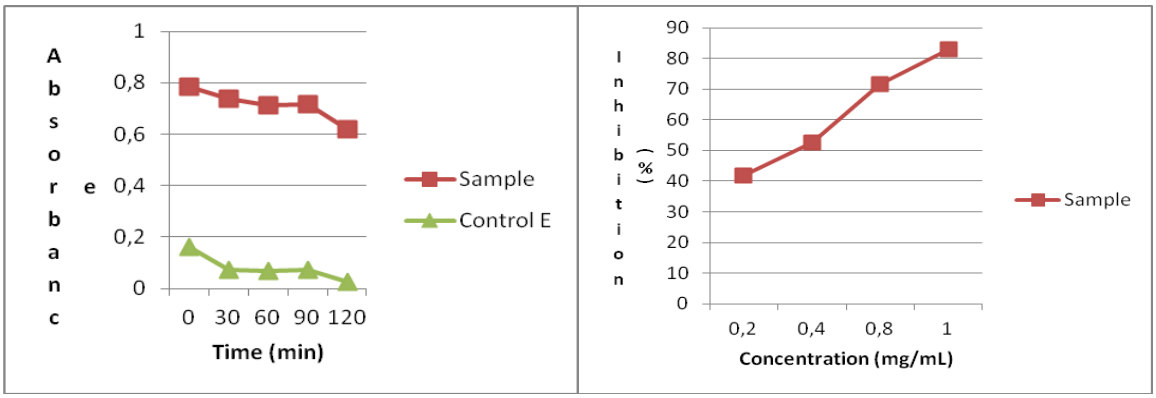

Figure 2. Absorbance and inhibition graphics of Boniger Acid

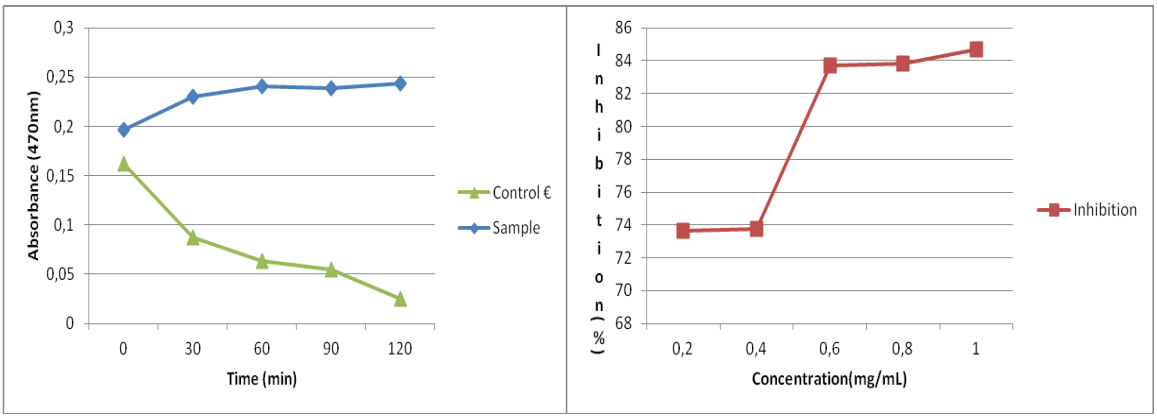

Figure 3. Absorbance and inhibition graphics of 5,17-[(Bis(azo)-bis(5-hydroxy-2,7-naphthalenedisulfonicacid)]-25,26,27,28-tetrahydroxy calix[4]arene