ABSTRACT

DETERMINATION OF EPIGALLOCATECHIN GALLATE (EGCG) AND CAFFEINE IN DOMESTIC GREEN TEA PRODUCTS USING TLC-DENSITOMETRY

Ali Nur Ad Deen

Many studies have shown that green tea contains high antioxidant activity of EGCG. Green tea also contains caffeine which could affect blood pressure. This study aims to determine the concentration of EGCG and caffeine simultaneously in domestic green tea product using TLC-densitometry. Sample preparation was carried out by extraction of green tea leaves with 40 mL water at 80 °C for 40 minutes with stiring. Then the analyte were extracted with ethyl acetate. The TLC-densitometry was validated previously using standard EGCG and caffeine. The stationary phase used is silica gel GF254. The mobile phase of chloroform: ethyl acetate: n-butanol: formic acid (2:1:0.7:0.3) was optimum for EGCG and caffeine separation with Rs 0.88 and 1.5 respectively. Detector was set at λ of 275 nm. Limit of detection (LOD) and limit of quantitation (LOQ) for EGCG were 7.95 ppm and 26.51 ppm. LOD and LOQ for caffeine were 5.59 ppm and 18.62 ppm. EGCG was linear at a concentration of 400-1800 ppm (r=0.9974) and caffeine at 80-720 ppm (r=0.9994). The accuracy and precision of EGCG and caffeine using standard additions were 95.30±5.03%, 98.18±2.86% and 5.28%, 2.91% respectively. These findings indicate that the TLC-densitometry method can be used for the determination of EGCG and caffeine concentrations simultaneously. This study obtained the concentrations of EGCG in sample coded A, B, C, D, and E were 2.14±0.01%, 2.20±0.02%, 2.13±0.04%, 1.67±0.06%, and 1.50±0.02% respectively and for caffeine were 0.68±0.03%, 0.71±0,02%, 0.70±0.03%, 0.61±0.01%, and 0.72±0.05% respectively.

Keywords : EGCG, caffeine, green tea product, TLC-Densitometry, validation.