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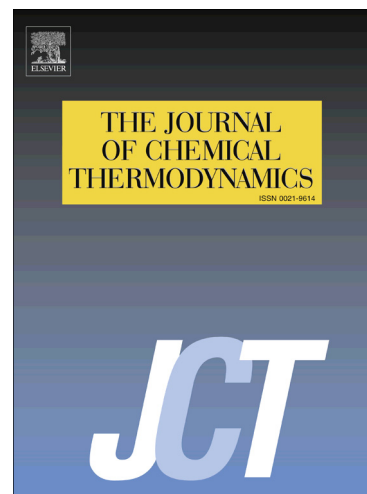
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## Interaction of Methimazole / Curcumin with Human Serum Albumin: Partial Molar Volume and Partial Molar Isentropic Compressibility Studies

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### ABSTRACT

Partial molar volume ( $V_{\phi}^0$ ) and partial molar isentropic compressibility ( $\kappa_{s\phi}^0$ ) values of drugs methimazole and curcumin in 25  $\mu\text{mol}\cdot\text{kg}^{-1}$  human serum albumin (HSA) solution have been evaluated using density and speed of sound data. The isentropic compressibility values  $\phi_{\kappa_s}$  of curcumin /methimazole + HSA solutions have also been computed. The  $\phi_{\kappa_s}$  values decrease with an increase in the molal concentration of drugs as well as with temperature. The variations of trends  $\phi_{\kappa_s}$  for the studied drugs have been discussed in terms of structure breaking behavior of drugs. The values of  $\phi_v^0$  and  $\phi_{\kappa_s}^0$  have been interpreted in terms of electrostatic and hydrophobic interactions operative in the solutions.

**Keywords:** Human serum albumin, Methimazole, Curcumin, Isentropic compressibility, Partial molar volume, Partial molar isentropic compressibility

### 1. Introduction

Human serum albumin (HSA) is the most abundant soluble protein in blood plasma. HSA provides a depot for many compounds, binds some ligands in a strained orientation providing their metabolic modification, renders potential toxins harmless transporting them to disposal sites, accounts for most of the anti-oxidant capacity of human serum, and acts as a NO-carrier [1]. HSA consists of 585 amino acids that form into three structurally similar  $\alpha$ -helical domains. These domains are characterized by a common motif of 10  $\alpha$ -helices. Each domain can be divided into sub-domains A and B, which contain six and four  $\alpha$ -helical, respectively [2-3]. The domain II and III of HSA contain two primary drug binding sites, known as Sudlow's site I and site II [4]. Several additional sites were also observed [5-9]. Crystallographic structural analysis of HSA-ligand complexes can reveal the molecular details of drug

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