Arsenic concentrations in Chinese coals

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The arsenic concentrations, of 297 coal samples collected from the main coal-mines of 26 provinces in China, were determined by the molybdenum blue coloration method. These samples were collected from coal that varied widely in rank and coal-forming periods from the five main coal-bearing regions in China. Coal sampling sites are shown in Fig. 1. The contents of arsenic in Chinese coals exhibit a logarithmic normal frequency distribution (Fig. 2). Arsenic content in Chinese coals range between 0.24 mg/kg to 71 mg/kg. The mean concentration of arsenic is 6.4±0.5 mg/kg and the geometric mean is 4.0±8.5 mg/kg. The level of arsenic in China is higher in northeastern and southern provinces, but lower in northwestern provinces. It was observed that the arsenic contents decreases with coal rank in the order: Tertiary> Early Jurassic> Late Triassic> Late Jurassic> Middle Jurassic> Late Permian> Early Carboniferous> Middle Carboniferous> Late Carboniferous> Early Permian. It was also noted that the arsenic contents in the Chinese coals decrease in the order: Subbituminous> Anthracite> Bituminous. However, the geological characteristics of region have more effect on arsenic distribution than does the rank. Compared with the coals from around the world, the average arsenic content of Chinese coals are lower.

Fig. 1. Sketch map showing the sampling sites of coal in China