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(57) Abstract :

The carbon content in coal may be assessed and predicted using a multi-model regression approach that inputs mid-infrared FTIR spectroscopic data. The area under the curve (AUC) of forty-two selective absorption bands, sensitive to the carbon compounds in coal in the range of 4000 and 400 cm⁻¹ is identified using the analysis of the infrared spectra of coal. By employing FTIR spectroscopy, these characteristics could be useful in estimating the carbon content of coal. Machine learning algorithms including artificial neural networks (ANN), partial least squares regression (PLSR), support vector regression (SVR), and random forest (RF) are used to predict the carbon content in coal. A robust and versatile tool for rapidly determining the carbon content of coal from different global basins; the multi-model estimation (MME) method uses the average of the RF, PLSR, and SVR models. This method shows significantly lower residual values with predicted values very close to the observed values. Fig. 1.

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