

**Fig.1 The correlation of TOC content alteration and specific surface area evolution of black shale samples in different group.**



**Fig.2 The correlation of pyrite content alteration and specific surface area evolution of black shale samples in different group.**



**Fig.3 The correlation of clay minerals content alteration and specific surface area evolution of black shale samples in different group.**



**Fig.4 The correlation of illite content alteration and specific surface area evolution of black shale samples in different group.**



**Fig.5 The correlation of smetite content alteration and specific surface area evolution of black shale samples in different group.**



**Fig. 6 The correlation of clay minerals content alteration and pore evolution of black shale samples in different group.**



**Fig. 8 The correlation of clay minerals content alteration and micro-pores evolution of black shale samples in different group.**



**Fig. 9 The correlation of clay minerals content alteration and meso-pores evolution of black shale samples in different group.**



**Fig. 10 The correlation of clay minerals content alteration and macro-pores evolution of black shale samples in different group.**



**Fig. 11 The correlation of illite content alteration and pore evolution of black shale samples in different group.**



**Fig. 12 The correlation of illite content alteration and micro-pores evolution of black shale samples in different group.**



**Fig. 13 The correlation of illite content alteration and meso-pores evolution of black shale samples in different group.**



**Fig. 14 The correlation of illite content alteration and macro-pores evolution of black shale samples in different group.**



**Fig. 15 The correlation of smectite content alteration and pore evolution of black shale samples in different group.**



**Fig. 16 The correlation of smectite content alteration and micro-pores evolution of black shale samples in different group.**



**Fig. 17 The correlation of smectite content alteration and meso-pores evolution of black shale samples in different group.**



**Fig. 18 The correlation of smectite content alteration and macro-pores evolution of black shale samples in different group.**



**Fig. 19 The correlation of pyrite content alteration and pore evolution of black shale samples in different group.**



**Fig. 20 The correlation of pyrite content alteration and micro-pores evolution of black shale samples in different group.**



**Fig. 21 The correlation of pyrite content alteration and meso-pores evolution of black shale samples in different group.**



**Fig. 22 The correlation of pyrite content alteration and macro-pores evolution of black shale samples in different group.**