# **Supporting information**

### Investigations on the mechanism, kinetic and isotherm of ammonium and humic

## acid co-adsorption at low temperature by 4A-molecular sieve modified from

### attapulgite

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# 1. Determination of $pH_{zpc}$ of 4A-molecular sieve

The  $pH_{zpc}$  of 4A-molecular sieve was determined by pH drift procedure, and the data was shown in Fig. S1. It can be seen from the Fig. S1, the  $pH_{zpc}$  of 4A-molecular sieve was around 4.11.



Fig. S1 Surface charge analysis of 4A-molecular sieve