Chong, see below:

\begin{align} \sup_{\alpha:|\alpha|\le 1} \sum_{i}\epsilon_i\left(\sum_j \alpha_j K_{ji}\right)=&\sup_{\alpha:|\alpha|\le 1}\epsilon'K\alpha \\ =&\sup_j |(\epsilon'K)_j|\\ =& \sup_j \sum_j K_{ji}|\epsilon_i| \end{align}

So if ϵ_i are all positive, this is correct.

If ϵ_i are all negative, then it should be $\sup_j [-\sum_j K_{ji}\epsilon_i]$