**Table 2. IR features of water and K2CO3 aqueous solutions.**

**Peak Height a *R*. *A*.(Height) Peak Area(cm-1) a *R*. *A*.(Area)**

***c*(mol/L) *c*(CO32-)/*c*(H2O) b  *A~*1400 *A~*1655 *A~*3417 1655/3417****c 1400/1655 1400/3417 *A~*1400 *A~*1655 *A~*3417 1655/3417 1400/1655 1400/3417**

0.00(0) d 0.000(0) 0.088 0.662 0.132 6.144 268.87 0.023

0.50(2) 0.009(1) 0.035 0.078 0.591 0.132 0.449 0.059 3.071 8.238 252.98 0.033 0.373 0.012

1.00(3) 0.019(1) 0.116 0.144 0.739 0.195 0.806 0.157 12.646 15.401 323.46 0.048 0.821 0.039

1.50(5) 0.028(2) 0.090 0.071 0.486 0.146 1.268 0.185 9.115 7.058 232.69 0.030 1.291 0.039

2.00(6) 0.038(3) 0.097 0.058 0.352 0.165 1.672 0.276 9.881 5.627 169.57 0.033 1.756 0.058

2.50(8) 0.049(4) 0.109 0.050 0.320 0.156 2.180 0.341 11.936 5.195 161.52 0.032 2.298 0.074

3.00(9) 0.061(5) 0.364 0.185 0.648 0.285 1.968 0.562 46.221 24.955 328.79 0.076 1.852 0.141

3.50(11) 0.073(6) 0.378 0.158 0.595 0.266 2.392 0.635 46.697 18.716 306.65 0.061 2.495 0.152

4.00(12) 0.087(7) 0.506 0.205 0.631 0.325 2.468 0.802 67.470 2 7.957 340.62 0.082 2.413 0.198

4.50(14) 0.100(8) 0.289 0.083 0.493 0.168 3.482 0.586 34.042 7.466 275.08 0.027 4.560 0.124

5.00(15) 0.117(10) 0.405 0.122 0.541 0.226 3.320 0.749 52.534 16.446 291.97 0.056 3.194 0.180

5.50(17) 0.131(12) 0.580 0.164 0.607 0.270 3.537 0.956 78.833 27.699 338.02 0.082 2.846 0.233

a The peak heights and areas are directly extracted from the IR spectra.

b Thisrefers to the relative concentration of the CO32- ion (mol/L) to the H2O (mol/L) calculated according to the measured density.

c 1655/3417 means that the relative absorbance is for the IR peak at ~1655 cm-1 over the IR peak at ~3417 cm-1.

d Number in parentheses is one standard deviation in the rightmost digit. The concentration errors of K2CO3aqueous solutions are assumed as 3%.