

Table.S1 Result of nonparametric tests for the UCS of Pb-CSCSs

| Binder ratios | Null hypothesis | Test | Significance | Decisions |
|---------------|--|--|--------------|----------------------------|
| C2.5S5F5 | The distributions of the q_u of Pb-CSCSs with Pb^{2+} concentration 0.05%, 0.5% and 1% are the same. | Related-Samples Kendall's Coefficient of Concordance | 0.115 | Retain the null hypothesis |
| C5S2.5F2.5 | | | 0.030 | Reject the null hypothesis |
| C5S5 | | | 0.223 | Retain the null hypothesis |

Note: the significance level is 0.05.

Table.S2 Pairwise comparison of the UCS of the C5S2.5F2.5 solidified Pb-contaminated soil

| Sample1-Sample2 | Test statistics | Standard error | Standard test statistics | Significance | Adjusted significance |
|-----------------|-----------------|----------------|--------------------------|--------------|-----------------------|
| 0.05%-0.5% | -0.500 | 0.577 | -0.866 | 0.386 | 1.000 |
| 0.05%-1% | 1.500 | 0.577 | 2.598 | 0.009 | 0.028 |
| 0.5%-1% | 1.000 | 0.577 | 1.732 | 0.083 | 0.250 |

Note: the significance level is 0.05.

Table.S3 Result of a nonparametric hypothesis test for the E_{50} of Pb-CSCSs

| Binder ratios | Null hypothesis | Test | Significance | Decisions |
|---------------|---|--|--------------|----------------------------|
| C2.5S5F5 | The distributions of the E_{50} of Pb-CSCSs with Pb^{2+} concentration 0.05%, 0.5% and 1% are the same. | Related-Samples Kendall's Coefficient of Concordance | 0.607 | Retain the null hypothesis |
| C5S2.5F2.5 | | | 0.607 | Retain the null hypothesis |
| C5S5 | | | 0.002 | Reject the null hypothesis |

Note: the significance level is 0.05.

Table.S4 Pairwise comparison of the E_{50} of the C5S5 solidified Pb-contaminated soil

| Sample1-Sample2 | Test statistics | Standard error | Standard test statistics | Significance | Adjusted significance |
|-----------------|-----------------|----------------|--------------------------|--------------|-----------------------|
| 0.05%-0.5% | 1.000 | 0.577 | 1.732 | 0.083 | 0.250 |
| 0.05%-1% | 2.000 | 0.577 | 3.464 | 0.001 | 0.002 |
| 0.5%-1% | 1.000 | 0.577 | 1.732 | 0.083 | 0.250 |

Note: the significance level is 0.05.

Table.S5 Result of nonparametric hypothesis tests for the φ of Pb-CSCSs

| Binder ratios | Null hypothesis | Test | Significance | Decisions |
|---------------|--|--|--------------|----------------------------|
| C2.5S5F5 | The distributions of the φ of Pb-CSCSs with Pb^{2+} concentration 0.05%, 0.5% and 1% are the same. | Related-Samples Kendall's Coefficient of Concordance | 0.016 | Reject the null hypothesis |
| C5S2.5F2.5 | | | 0.115 | Retain the null hypothesis |
| C5S5 | | | 0.115 | Retain the null hypothesis |

Note: the significance level is 0.05.

Table.S6 Pairwise comparison of the φ of the C2.5S5F5 solidified Pb-contaminated soil

| Sample1-Sample2 | Test statistics | Standard error | Standard test statistics | Significance | Adjusted significance |
|-----------------|-----------------|----------------|--------------------------|--------------|-----------------------|
| 0.05%-0.5% | 0.833 | 0.577 | 1.443 | 0.149 | 0.447 |
| 0.05%-1% | 1.667 | 0.577 | 2.887 | 0.004 | 0.012 |
| 0.5%-1% | 0.833 | 0.577 | 1.443 | 0.149 | 0.447 |

Note: the significance level is 0.05.

Table.S7 Result of nonparametric hypothesis tests for the *c* of Pb-CSCSs

| Binder ratios | Null hypothesis | Test | Significance | Decisions |
|---------------|--|--|--------------|----------------------------|
| C2.5S5F5 | The distributions of the <i>c</i> of Pb-CSCSs with Pb ²⁺ concentration 0.05%, 0.5% and 1% are the same. | Related-Samples Kendall's Coefficient of Concordance | 0.011 | Reject the null hypothesis |
| C5S2.5F2.5 | | | 0.311 | Retain the null hypothesis |
| C5S5 | | | 0.136 | Retain the null hypothesis |

Note: the significance level is 0.05.

Table.S8 Pairwise comparison of *c* of the C2.5S5F5 solidified Pb-contaminated soil

| Sample1-Sample2 | Test statistics | Standard error | Standard test statistics | Significance | Adjusted significance |
|-----------------|-----------------|----------------|--------------------------|--------------|-----------------------|
| 0.05%-0.5% | 0.000 | 0.577 | 0.000 | 1.000 | 1.000 |
| 0.05%-1% | -1.500 | 0.577 | -2.598 | 0.009 | 0.028 |
| 0.5%-1% | -1.500 | 0.577 | -2.598 | 0.009 | 0.028 |

Note: the significance level is 0.05.

Table.S9 Result of nonparametric hypothesis tests for the *k* of Pb-CSCSs

| Binders ratios | Null hypothesis | Test | Significance | Decisions |
|----------------|--|--|--------------|----------------------------|
| C2.5S5F5 | The distributions of the <i>k</i> of Pb-CSCSs with Pb ²⁺ concentration 0.05%, 0.5% and 1% are the same. | Related-Samples Kendall's Coefficient of Concordance | 0.002 | Reject the null hypothesis |
| C5S2.5F2.5 | | | 0.607 | Retain the null hypothesis |
| C5S5 | | | 0.009 | Reject the null hypothesis |

Note: the significance level is 0.05.

Table.S10 Pairwise comparison of *k* of the C2.5S5F5 (C5S5) solidified Pb-contaminated soil

| Sample1-Sample2 | Test statistics | Standard error | Standard test statistics | Significance | Adjusted significance |
|-----------------|-----------------|----------------|--------------------------|---------------|-----------------------|
| 0.05%-0.5% | 1.000 (0.333) | 0.577 (0.577) | 1.732 (0.577) | 0.083 (0.564) | 0.250 (1.000) |
| 0.05%-1% | 2.000 (1.667) | 0.577 (0.577) | 3.464 (2.887) | 0.001 (0.004) | 0.002 (0.012) |
| 0.5%-1% | 1.000 (1.333) | 0.577 (0.577) | 1.732 (2.309) | 0.083 (0.021) | 0.250 (0.063) |

Note: the significance level is 0.05.

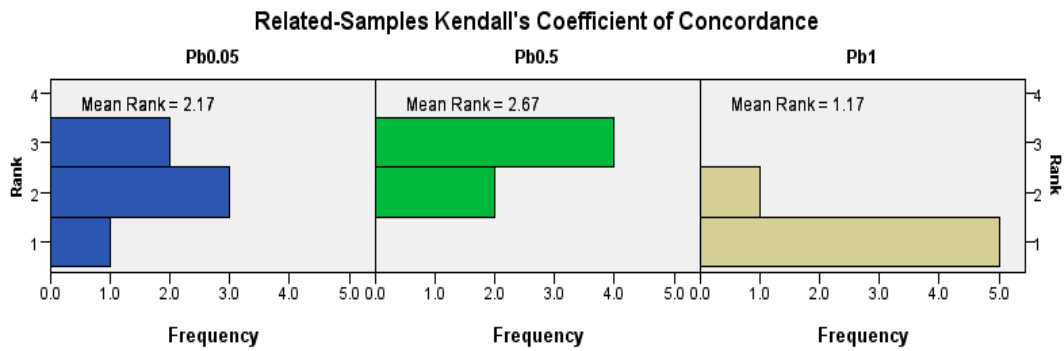


Fig.S1 The panel histogram of Kendall synergistic coefficient for related samples of the UCS of the C5S2.5F2.5 solidified Pb-contaminated soil

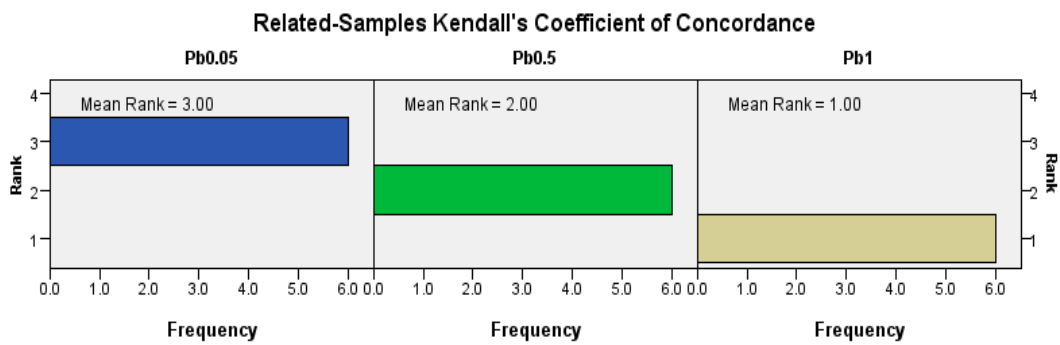


Fig.S2 Panel histogram of Kendall synergistic coefficient for related samples of the E50 of the C5S5 solidified Pb-contaminated soil

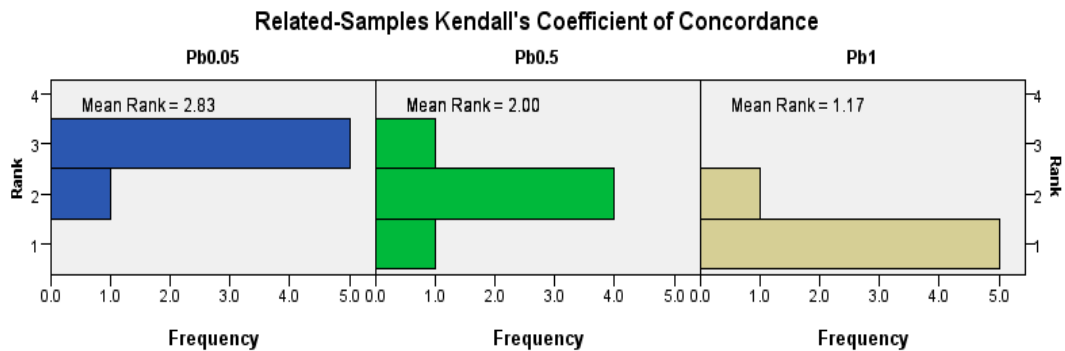


Fig.S3 Panel histogram of Kendall synergistic coefficient for related samples of the ϕ of the C2.55S5F5 solidified Pb-contaminated soil

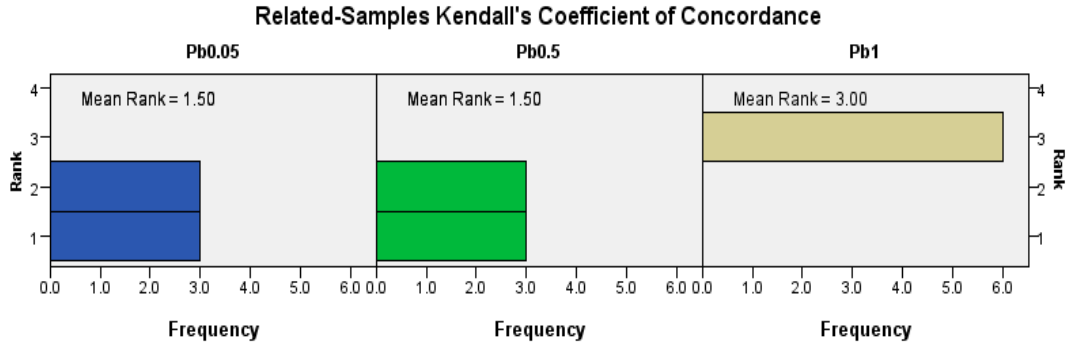
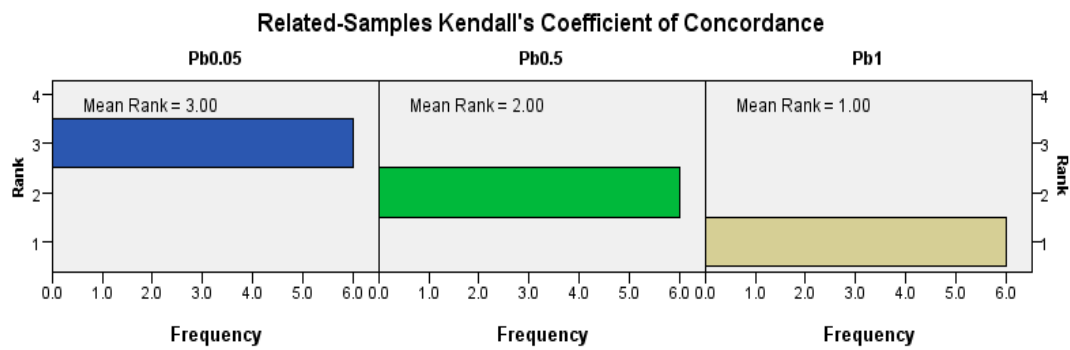
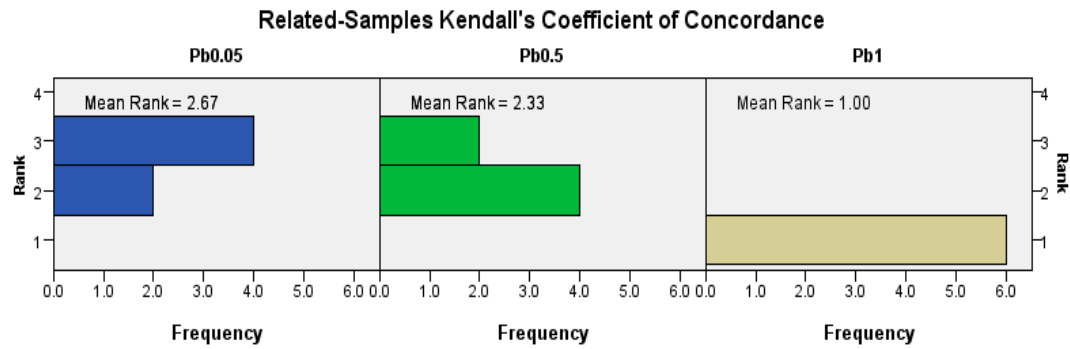


Fig.S4 Panel histogram of Kendall synergistic coefficient for related samples of the *c* of the C2.5S5F5 solidified Pb-contaminated soil



(a)C2.5S5F5



(b)C5S5

Fig.S5 Panel histogram of Kendall synergistic coefficient for related samples of *k* of the C2.5S5F5 and the C5S5 solidified Pb-contaminated soil