# Supplementary Information

## Metal Organic Frameworks for Selective Degradation of Amoxicillin in Biomedical Wastes

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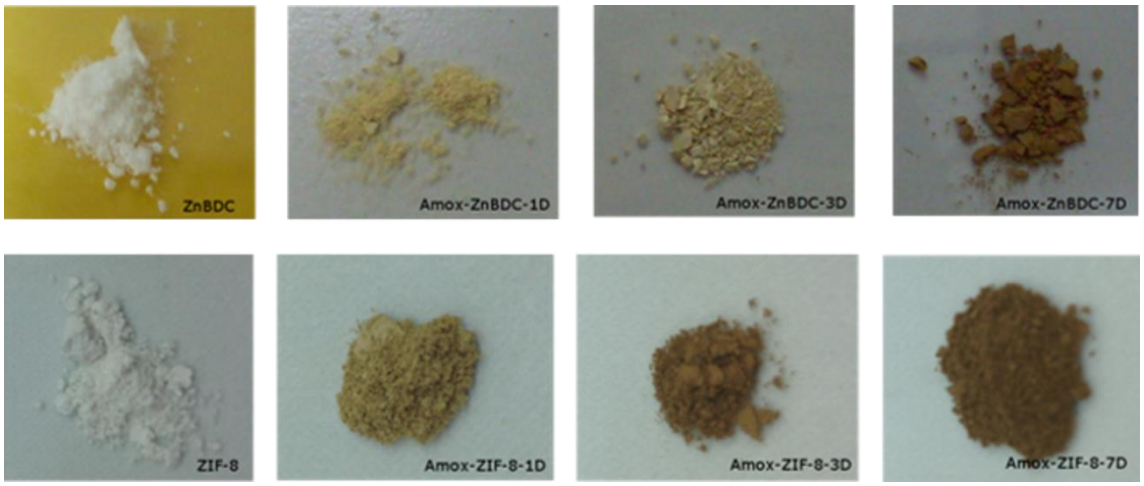


**Figure S1.** Coloration changes of ZIF-8 and ZnBDC after contact with amoxicillin for 1, 3 and 7 days.

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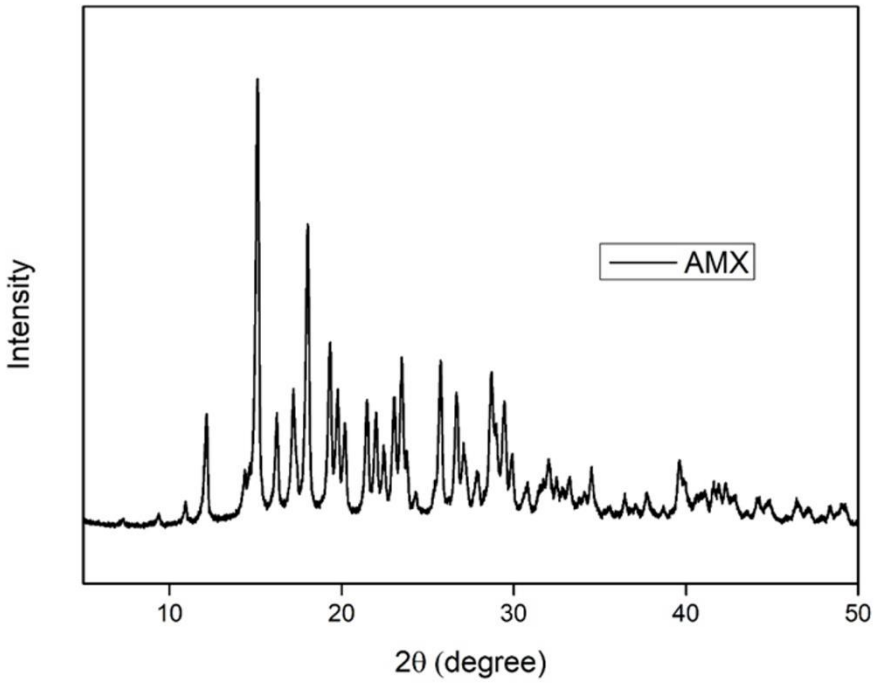


**Figure S2.** X-ray powder diffraction of pure amoxicillin.

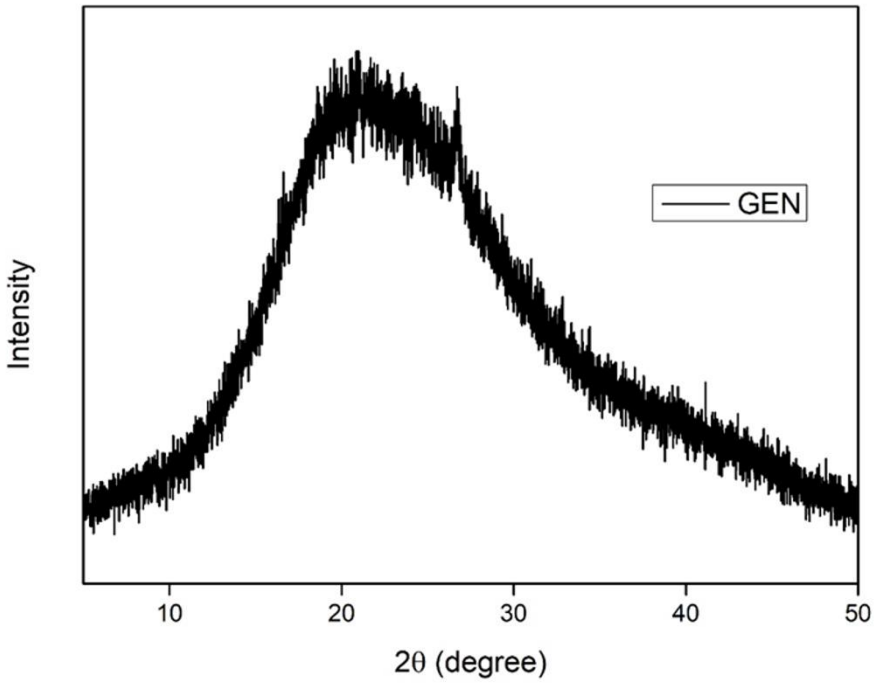


**Figure S3.** X-ray powder diffraction of pure gentamicin.

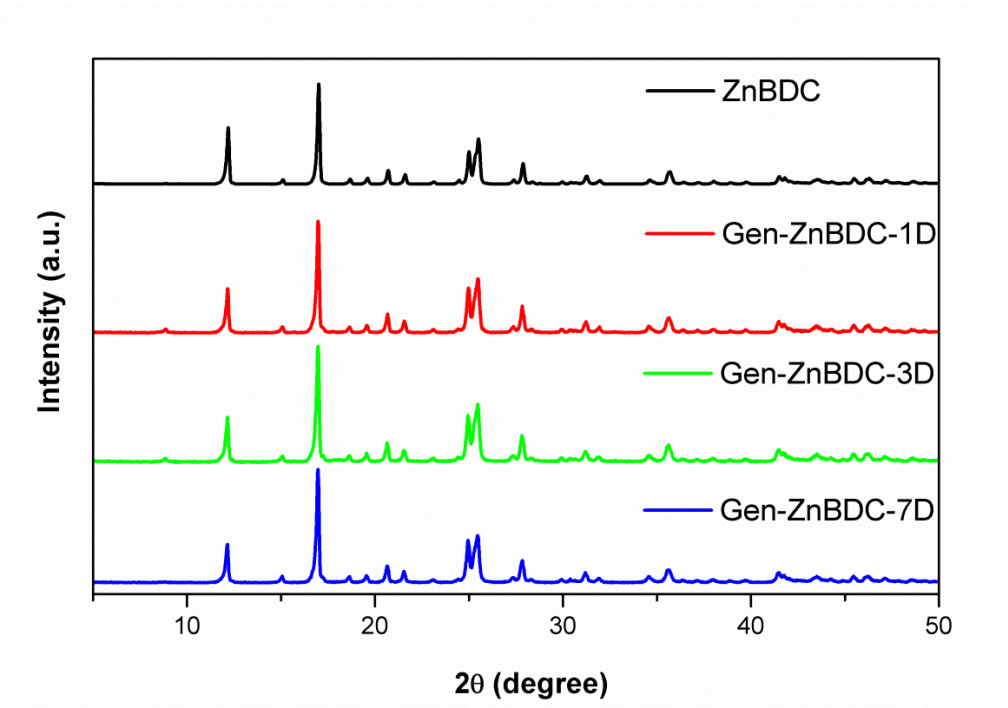


**Figure S4.** X-ray powder diffraction of pure ZnBDC and upon contact with gentamicin for 1, 3 and 7 days.

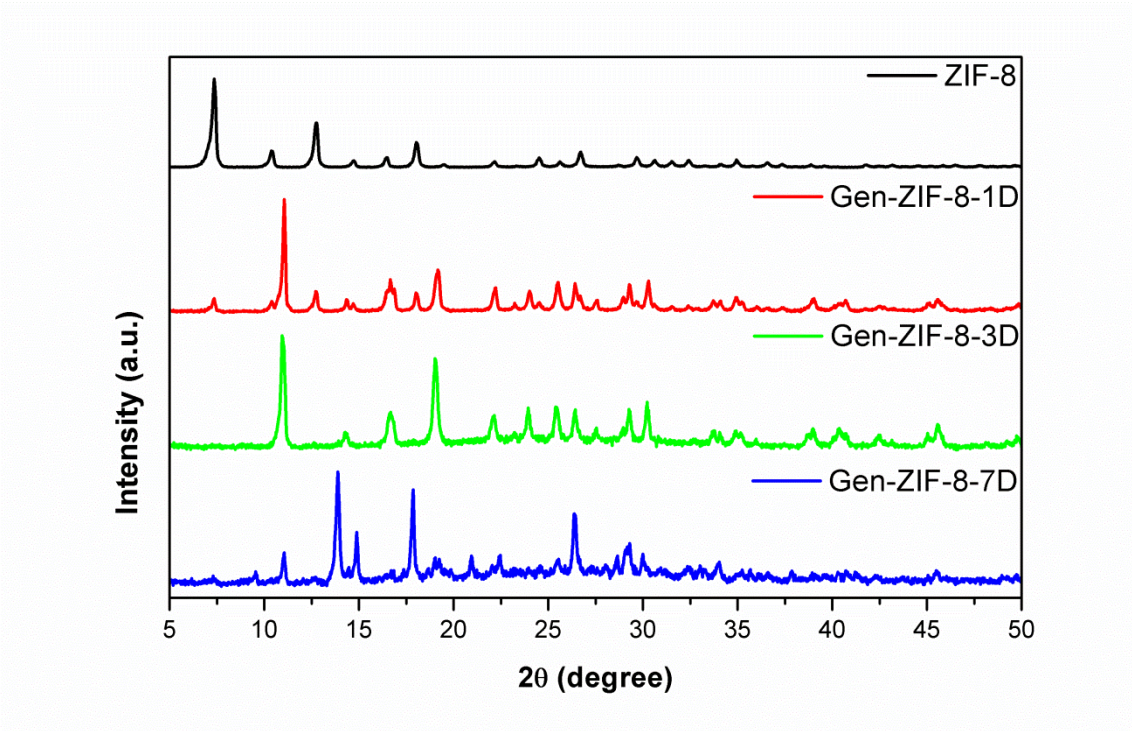


**Figure S5.** X-ray powder diffraction of pure ZIF-8 and upon contact with gentamicin for 1, 3 and 7 days.

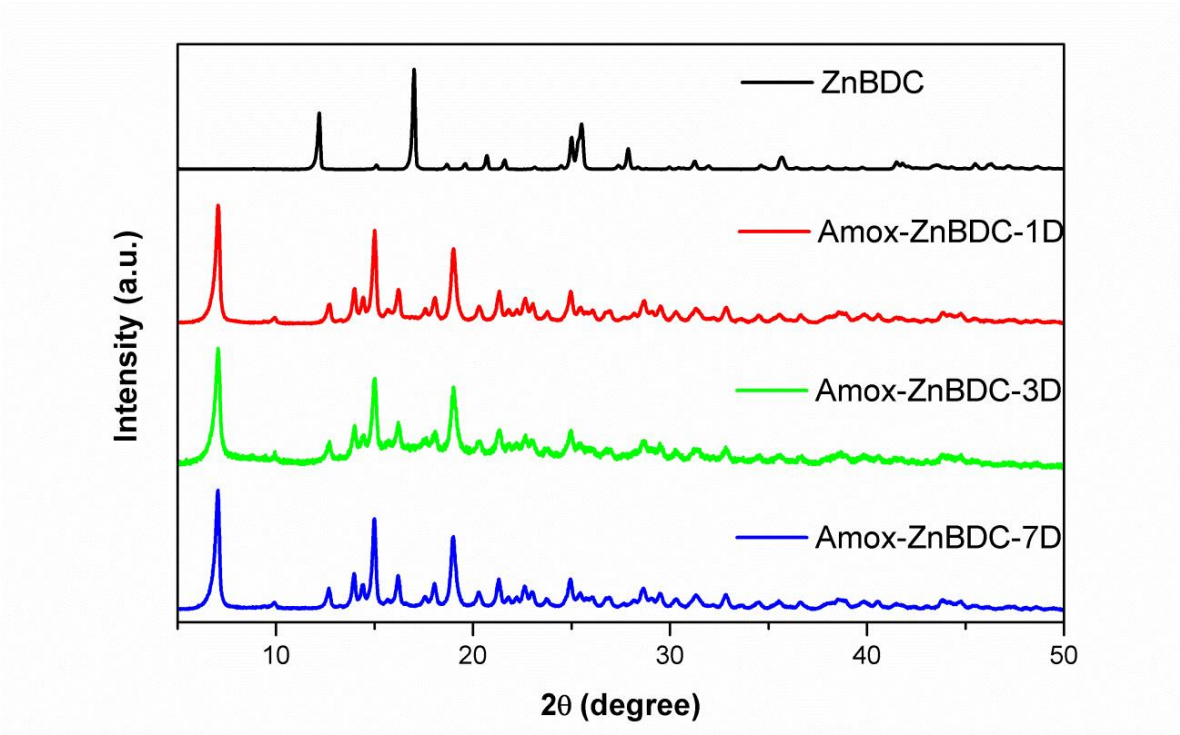


**Figure S6.** X-ray powder diffraction of pure ZnBDC and upon incorporation of amoxicillin for 1, 3 and 7 days.

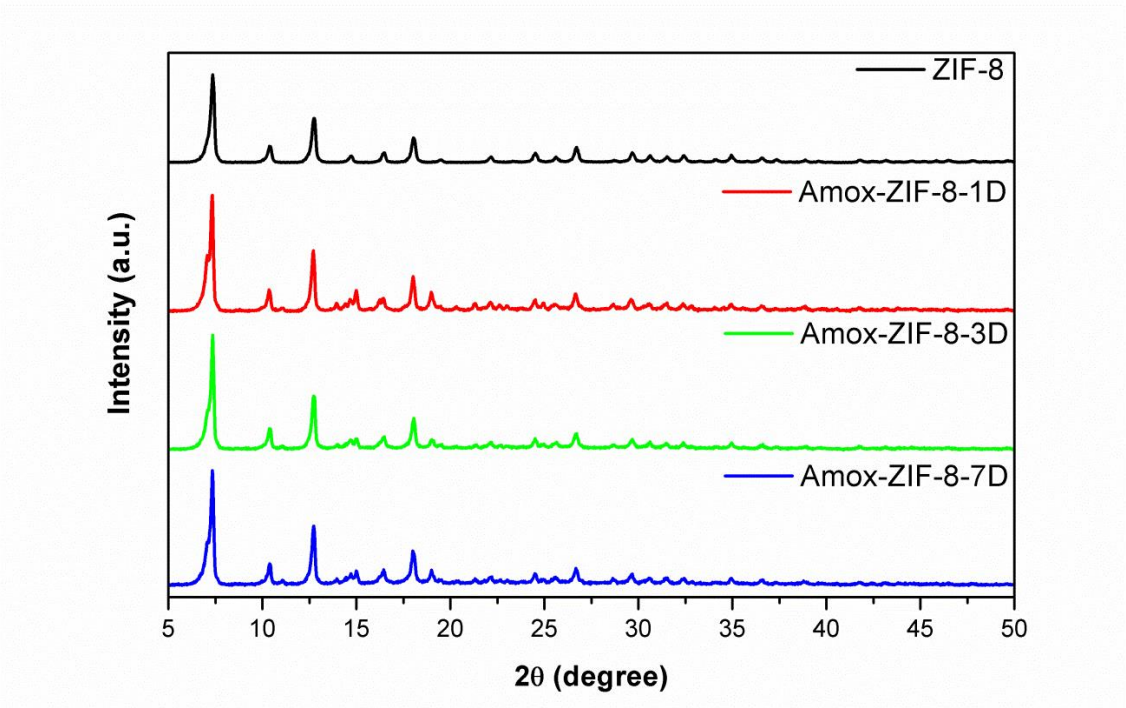


**Figure S7.** X-ray powder diffraction of pure ZIF-8 and upon incorporation of amoxicillin for 1, 3 and 7 days.

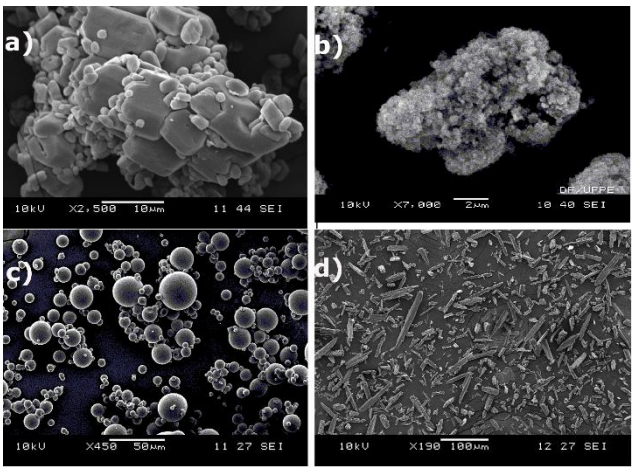


**Figure S8.** SEM micrographs of (a) ZnBDC; (b) ZIF-8; (c) gentamicin and (d) amoxicilin.

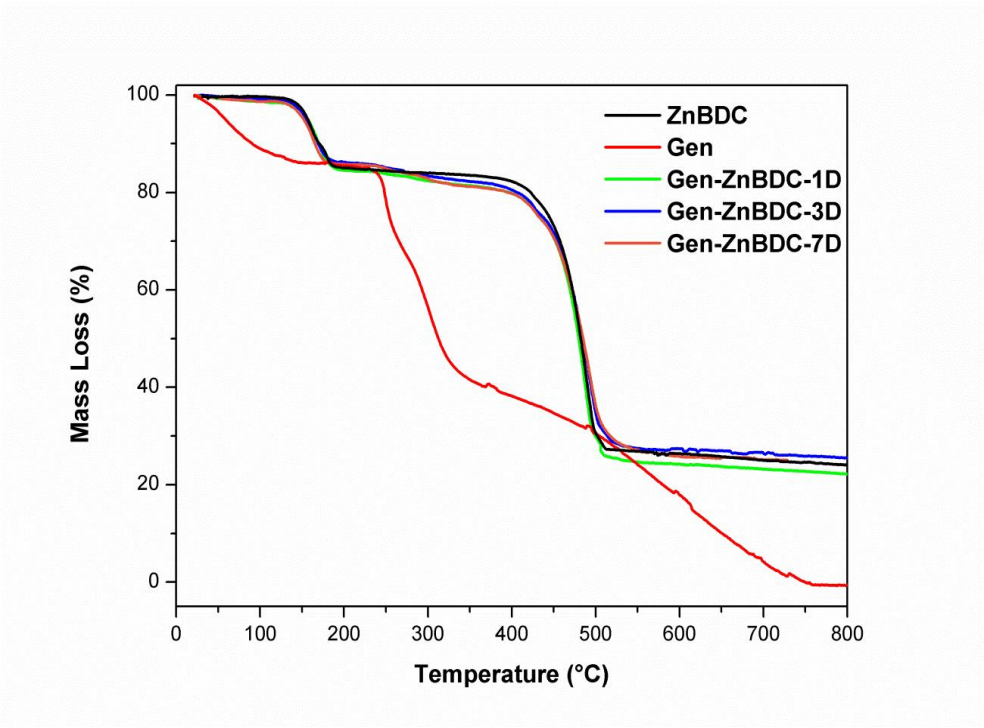


**Figure S9.** Thermogravimetric analysis of pure ZnBDC upon contact with gentamicin for 1, 3 and 7 days.

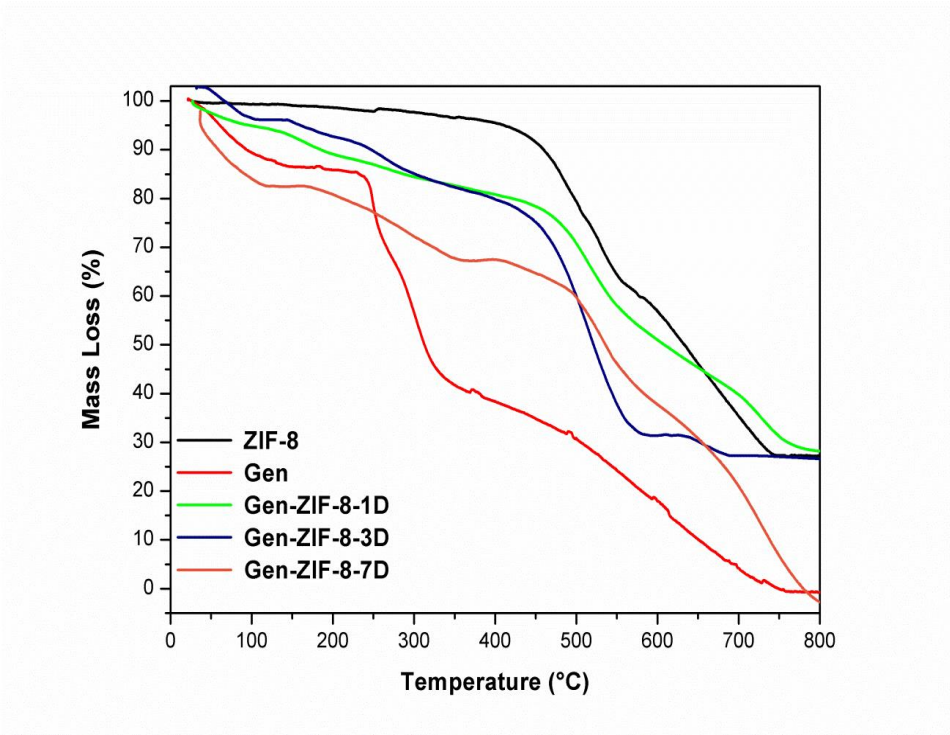


**Figure S10.** Thermogravimetric analysis of pure ZIF-8 and upon contact with gentamicin for 1, 3 and 7 days.

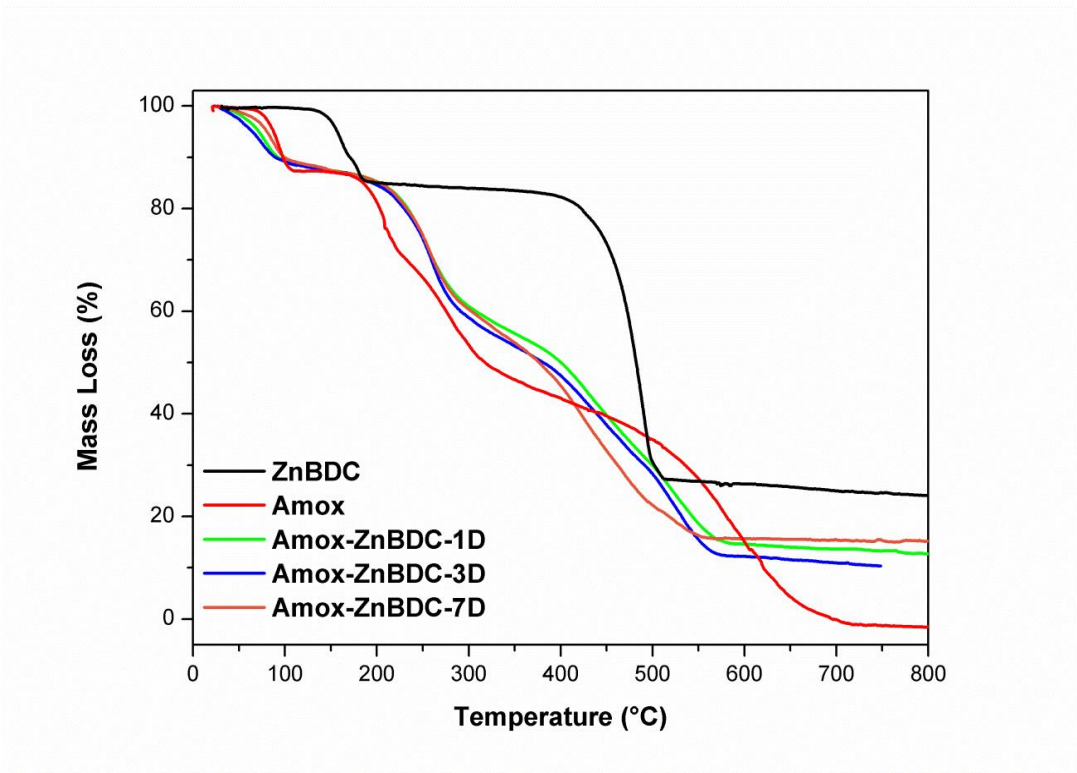


**Figure S11.** Thermogravimetric analysis of pure ZnBDC and upon incorporation of amoxicillin for 1, 3 and 7 days.

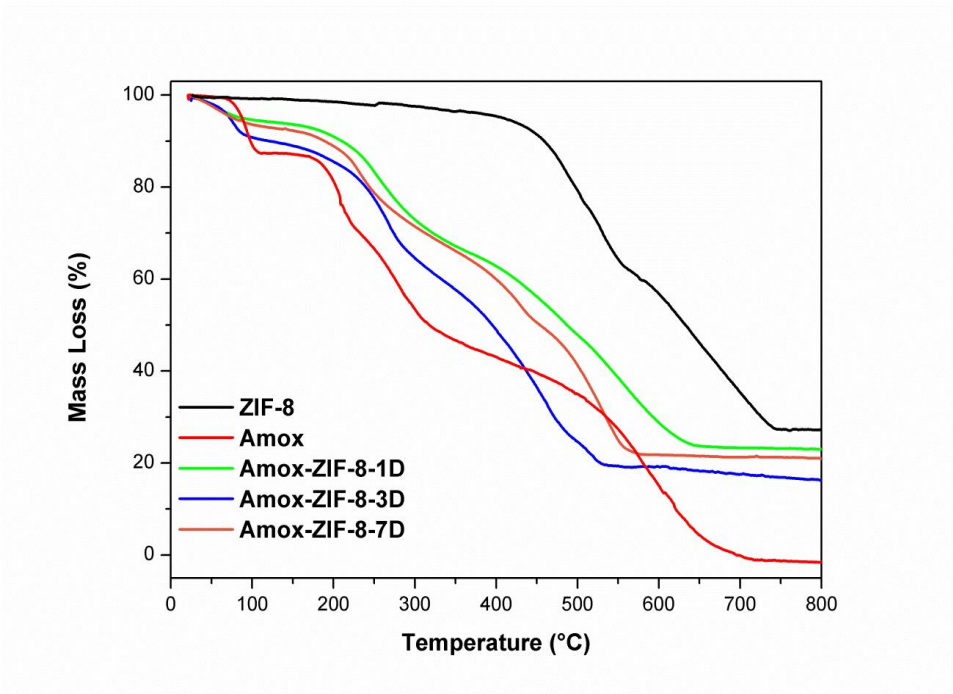


**Figure S12.** Thermogravimetric analysis of pure ZIF-8 and upon incorporation of amoxicillin for 1, 3 and 7 days.

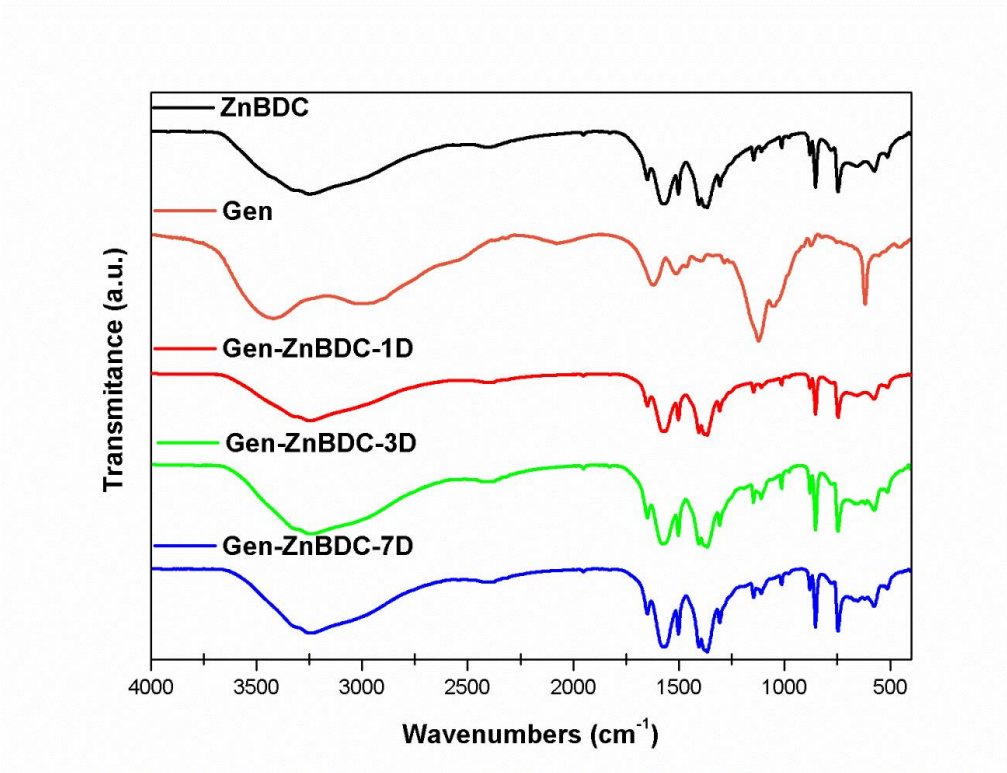


**Figure S13.** FTIR spectra of pure ZnBDC and upon incorporation of gentamicin for 1, 3 and 7 days.

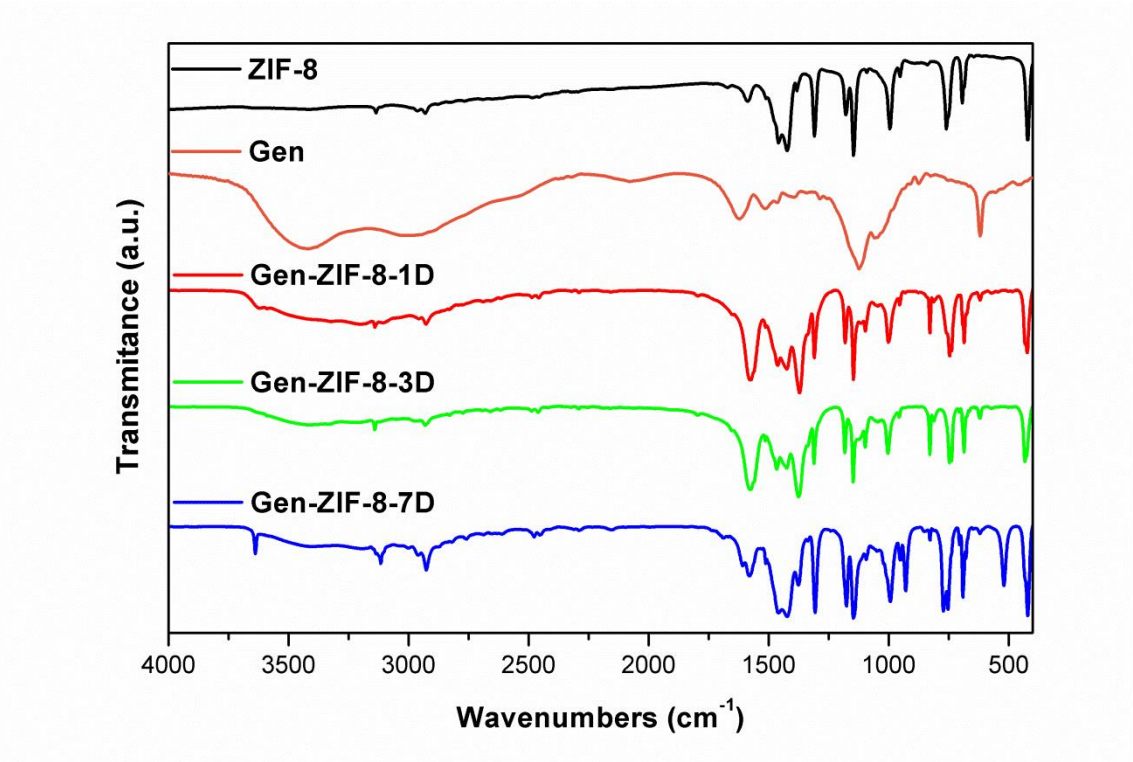


**Figure S14.** FTIR spectra of pure ZIF-8 and upon incorporation of gentamicin for 1, 3 and 7 days.

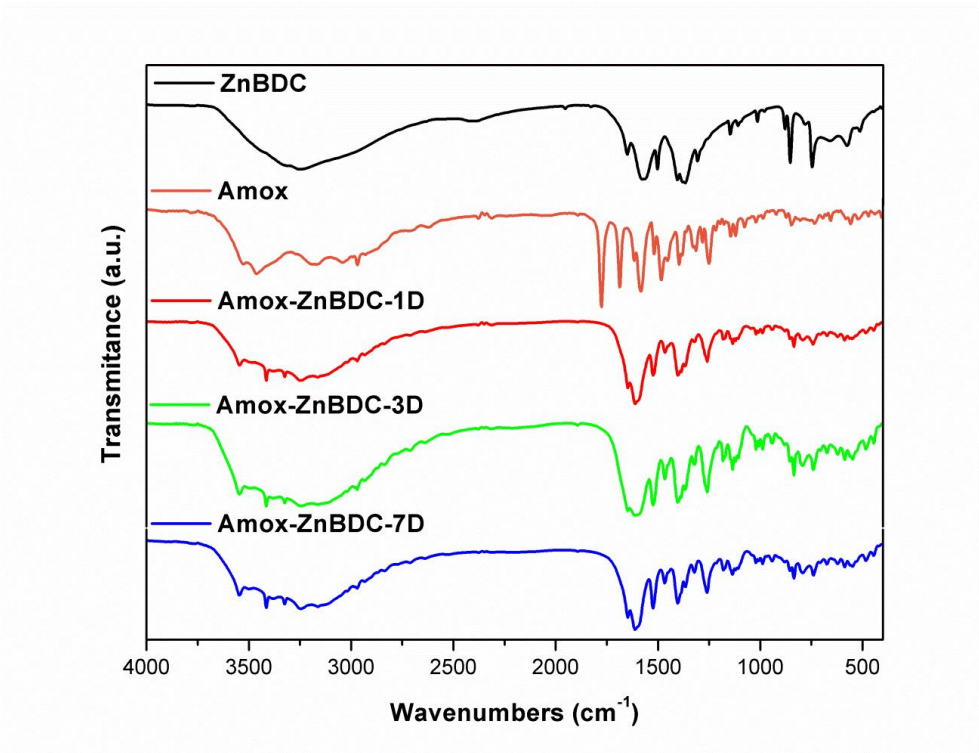


**Figure S15.** FTIR spectra of pure ZnBDC and upon incorporation of amoxicillin for 1, 3 and 7 days.

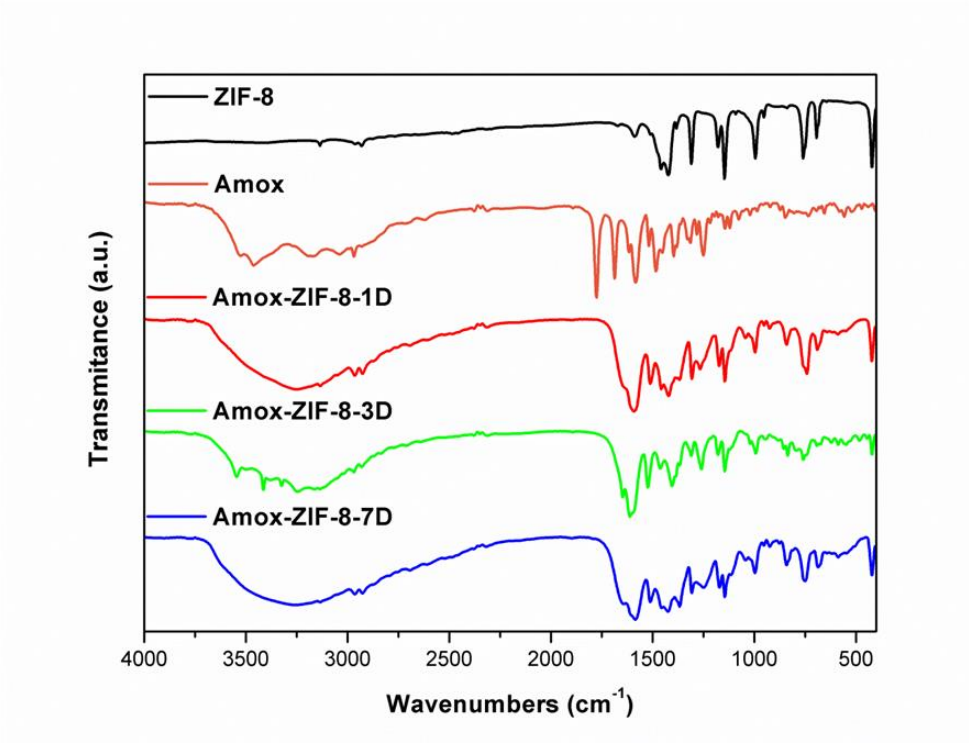


**Figure S16.** FTIR spectra of pure ZIF-8 and upon incorporation of amoxicillin for 1, 3 and 7 days.

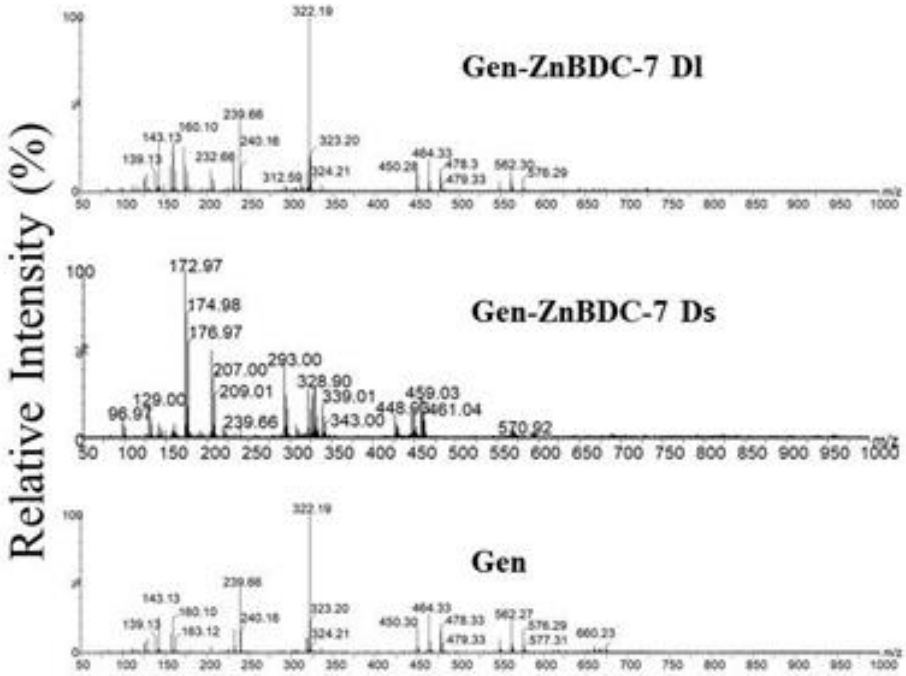


**Figure S17.** ESI(+)-MS of gentamicin, and Gen-ZnBDC (solid phase (Ds) and liquid (Dl)) at 7 days.

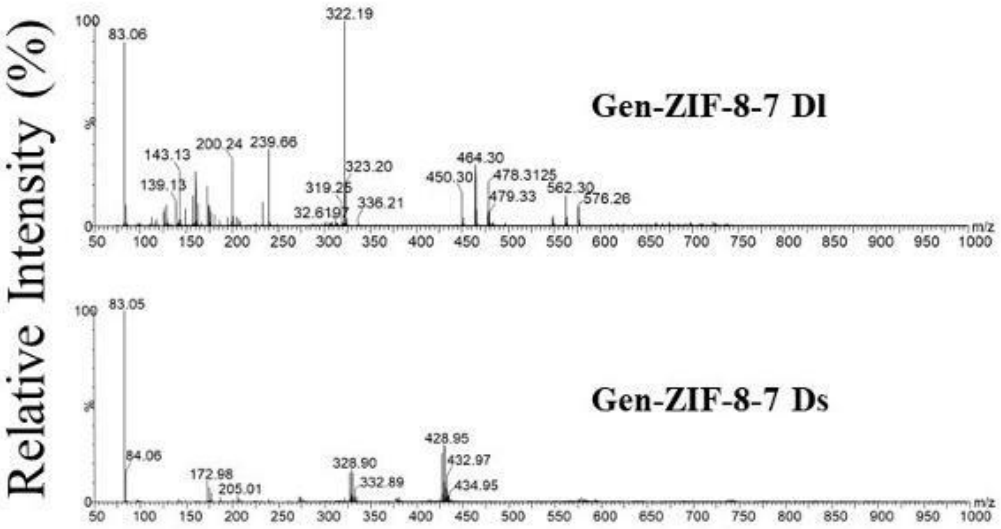


**Figure S18.** ESI(+)-MS of Gen-ZIF-8 (solid phase (Ds) and liquid (Dl)) at 7 days.

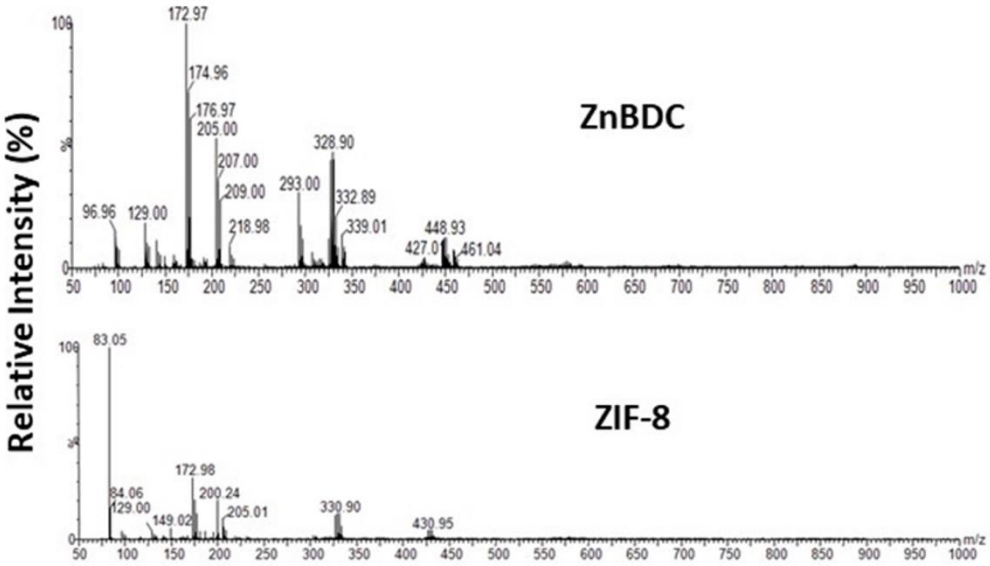


**Figure S19.** ESI(+)-MS for ZnBDC and ZIF-8.

**Table S1.** Thermal properties of evaluated systems

| Sample | $T_5$ / °C | $T_{10}$ / °C | Residual mass at 700 °C / % |
|---|---|---|---|
| ZnBDC | 56.97 | 170.76 | 25.00 |
| ZIF-8 | 409.97 | 459.08 | 35.33 |
| Amox | 87.74 | 97.75 | 0.00 |
| Gen | 58.64 | 90.77 | 4.21 |
| Gen-ZnBDC-1D | 157.13 | 169.85 | 23.22 |
| Gen-ZnBDC-3D | 155.49 | 169.11 | 26.39 |
| Gen-ZnBDC-7D | 152.04 | 165.23 | 25.14 |
| Gen-ZIF-8-1D | 68.38 | 186.07 | 56.05 |
| Gen-ZIF-3D | 249.05 | 415.05 | 41.00 |
| Gen-ZIF-8-7D | 263.80 | 408.90 | 60.66 |
| Amox-ZnBDC-1D | 71.54 | 92.70 | 13.66 |
| Amox-ZnBDC-3D | 64.39 | 89.53 | 10.96 |
| Amox-ZnBDC-7D | 80.41 | 99.63 | 15.43 |
| Amox-ZIF-8-1D | 88.22 | 210.35 | 23.36 |
| Amox-ZIF-8-3D | 72.73 | 121.59 | 17.56 |
| Amox-ZIF-8-7D | 76.46 | 189.13 | 21.28 |

$T_5$ and $T_{10}$: 5 and 10% weight loss temperatures of the samples, respectively; ZnBDC: Zn(1,4-benzenedicarboxylate); ZIF-8: zeolitic imidazolate framework-8; Amox: amoxicillin; Gen: gentamicin; 1D, 3D and 7D: drug incorporation period of 1, 3 and 7 days, respectively.

**Table S2.** Main peaks of the spectra presented in all samples evaluated

| Sample | ν(O–H) / $cm^{-1}$ | ν(C–$H_{arom}$) / $cm^{-1}$ | ν(C–$H_{aliph}$) / $cm^{-1}$ | ν(C–N) / $cm^{-1}$ | ν(N–H) / $cm^{-1}$ | ν(C–O) / $cm^{-1}$ | ν(C=O) / $cm^{-1}$ |
|---|---|---|---|---|---|---|---|
| ZnBDC | 3249 | OL[a] | – | – | – | 1110 | 1576 |
| ZIF-8 | – | 3131 | 2923 | 1145 | – | – | – |
| Amox | 3532 | 3046 | 2968 | 1480 | 3450 | 1143 | 1776 |
| Gen | 3420 | – | 2940 | 1447 | 3420 | 1120 | – |
| Gen-ZnBDC-1D | 3243 | OL[a] | – | – | – | 1103 | – |
| Gen-ZnBDC-3D | 3243 | OL[a] | – | – | – | 1103 | – |
| Gen-ZnBDC-7D | 3246 | OL[a] | – | – | – | 1101 | – |
| Gen-ZIF-8-1D | – | 3136 | 2921 | 1144 | – | – | – |
| Gen-ZIF-8-3D | – | 3138 | 2930 | 1146 | – | – | – |
| Gen-ZIF-8-7D | – | 3120 | 2923 | 1050 | – | – | – |
| Amox-ZnBDC-1D | 3536 | 3021 | 2962 | 1405 | – | 1136 | – |
| Amox-ZnBDC-3D | 3542 | 3027 | 2965 | 1407 | – | 1140 | – |
| Amox-ZnBDC-7D | 3544 | 3022 | 2962 | 1400 | – | 1138 | – |
| Amox-ZIF-8-1D | OL[b] | 3033 | 2967 | 1460 | OL[b] | 1138 | – |
| Amox-ZIF-8-3D | 3540 | 3033 | 2971 | 1459 | 3420 | 1140 | – |
| Amox-ZIF-8-7D | OL[b] | 3030 | 2970 | 1465 | OL[b] | 1140 | – |

[a]Overlapped (OL) with ν(O–H); [b]overlapped with ν(O–H) and ν(N–H). ZnBDC: Zn(1,4-benzenedicarboxylate); ZIF-8: zeolitic imidazolate framework-8; Amox: amoxicillin; Gen: gentamicin; 1D, 3D and 7D: drug incorporation period of 1, 3 and 7 days, respectively.

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