Electronic Supplementary Material (ESI) for Green Chemistry

ESI

SnTUD-1: A Solid Acid Catalyst for Three Component Coupling Reactions at room temperature

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Supplementary documents:

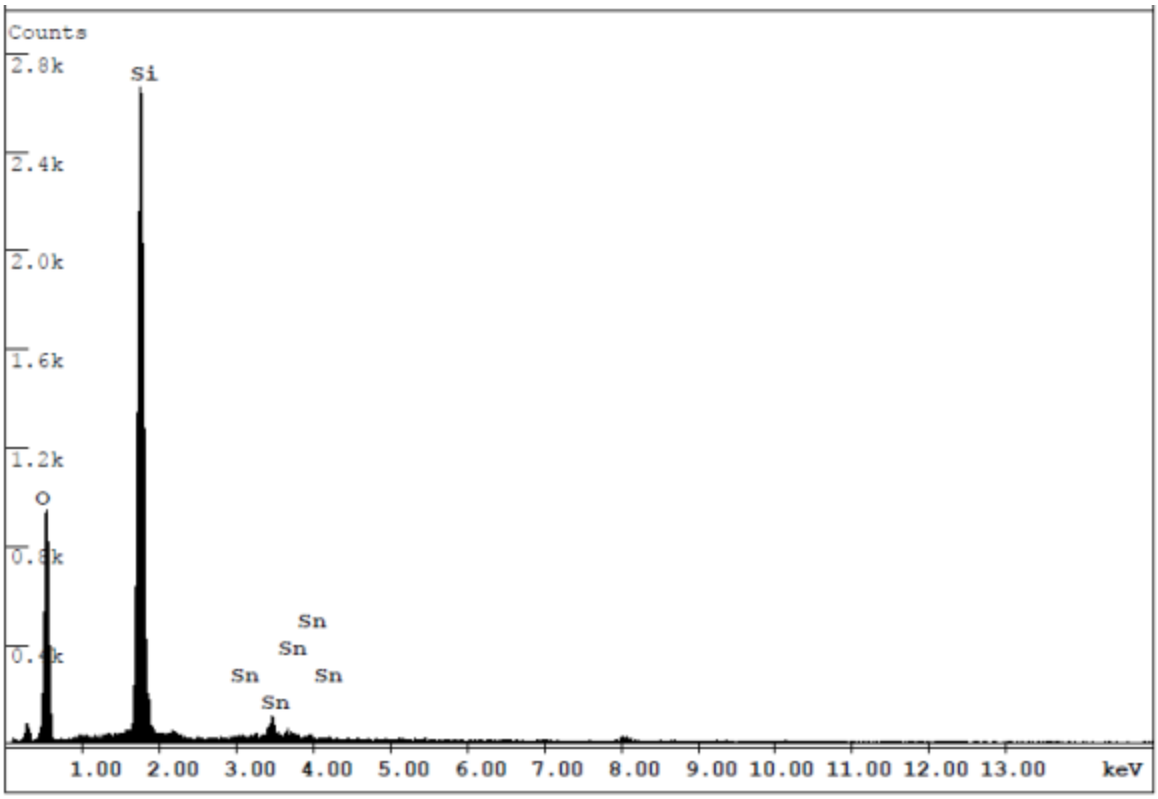


Fig. S1. SEM EDAX image of SnTUD-1

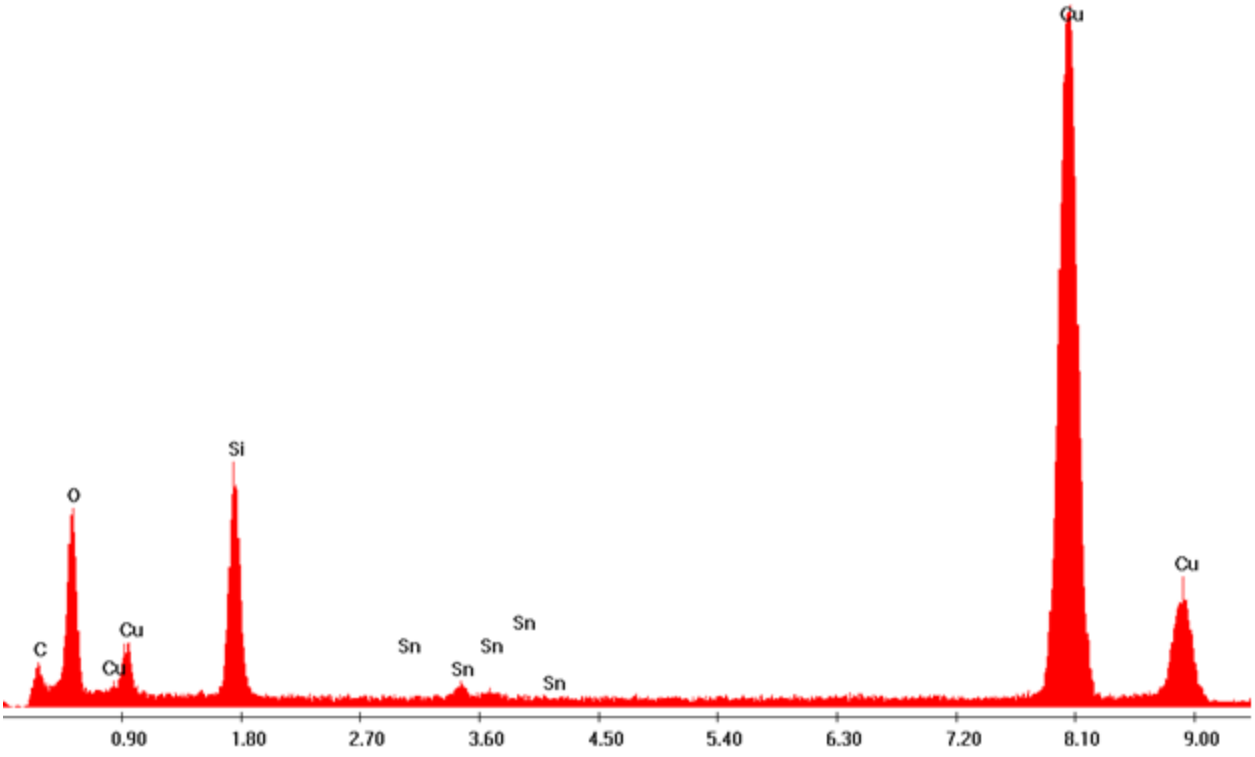


Fig. S2. HRTEM-EDX image of SnTUD-1

2. Experimental:

Isolated yield (%) = (Product experimental yield / Theoretical yield) X 100

Spectral data for the compounds:

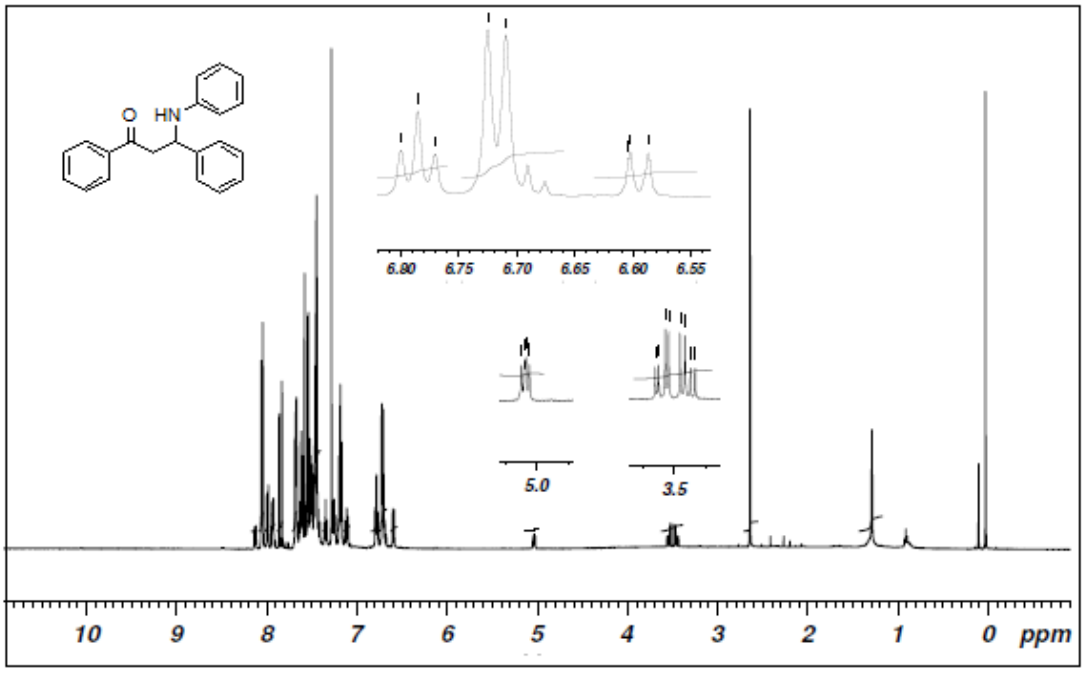


Fig. S3. 500 MHz ^{1}H NMR spectrum of 1,3-diphenyl-3-(phenylamino) propan-1-one.

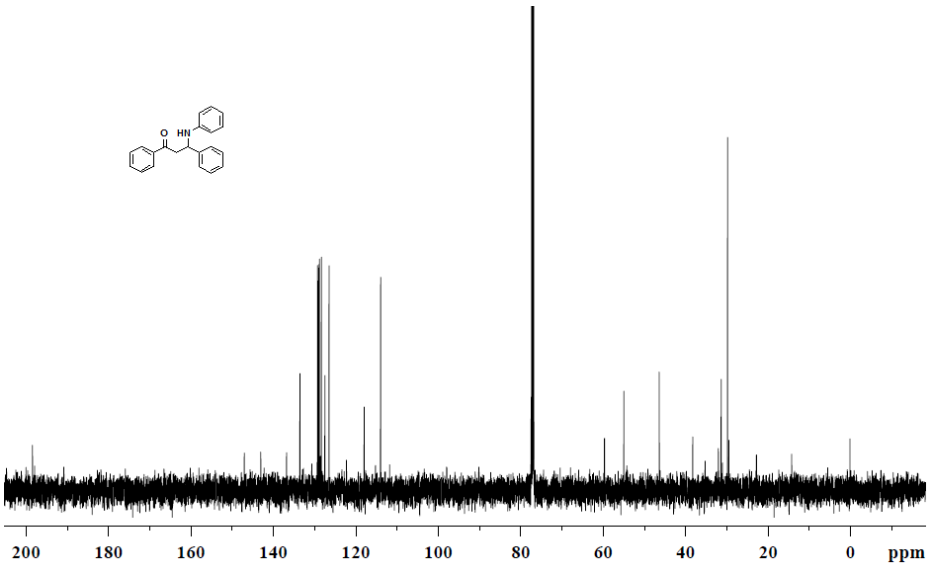


Fig. S4. 500 MHz ^{13}C NMR spectrum of 1,3-diphenyl-3-(phenylamino) propan-1-one

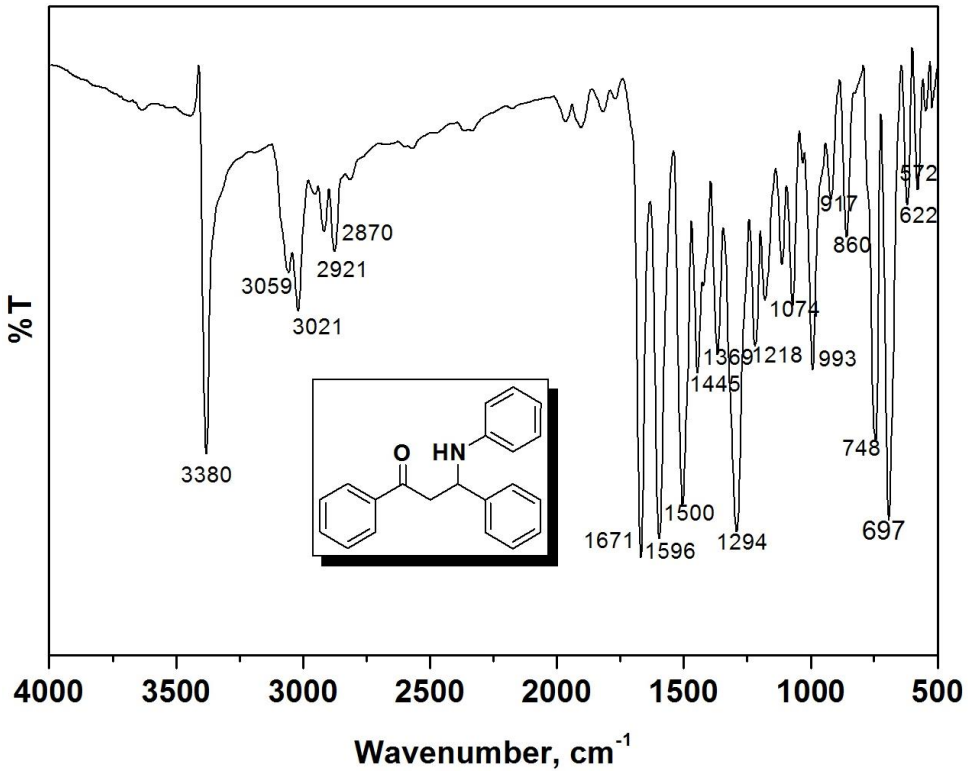
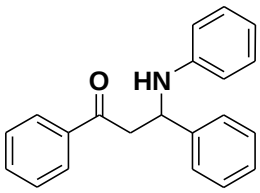
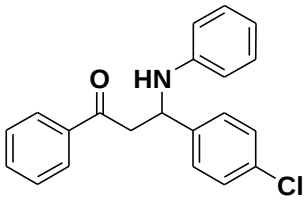


Fig. S5. FTIR spectra of 1,3-diphenyl-3-(phenylamino)propan-1-one.



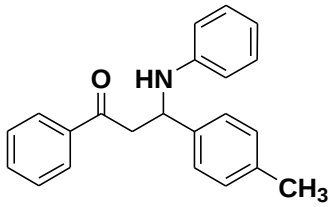
1,3-diphenyl-3-(phenylamino)propan-1-one

(Table.1 Entry.1) A White solid, ^{1}H NMR-(500 MHz, $CDCl_3$): δ 3.56-3.43 (m, 2H), 5.03 (m, 1H), 6.62-6.57 (d, 2H), 6.81–6.66 (m, 1H), 7.08–7.15 (m, 2H), 7.22–7.34 (m, 4H), 7.55–7.58 (m, 2H), 7.89–7.93 (m, 2H); ^{13}C NMR (500 MHz, $CDCl_3$): 46.4, 54.9, 59.6, 118.0, 127.5, 128.3, 128.9, 133.5, 136.8, 147.0, 198.4; FTIR (KBr, cm^{-1}): 3380, 3059, 3021, 2921, 1671, 1596, 1500, 1218, 1180, 748.



3-(4-chlorophenyl)-1-phenyl-3-(phenylamino)propan-1-one

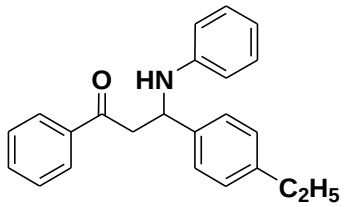
(Table.1.Entry.2) A white solid, ^{1}H NMR (500 MHz, $CDCl_3$): δ 3.58 (br, 2H), 5.01 (t, 1H), 6.66 (d, J = 8.1 Hz, 2H), 6.78 (m, 1H), 6.87-6.97 (b, 2H), 7.15 (t, J=7.5 Hz, 2H), 7.32-7.22 (m, 1H), 7.40-7.35 (m, 2H), 7.56-7.52 (m, 1H), 7.88 (d, J = 7.2 Hz, 2H); FTIR (KBr, cm^{-1}): 3392, 3047, 2921, 1664, 1602, 1501, 1287, 1093, 754.



1-phenyl-3-(phenylamino)-3-*p*-tolylpropan-1-one

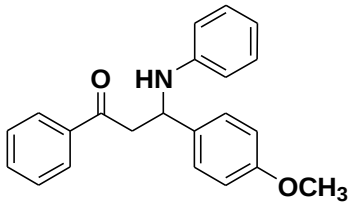
(Table.1.Entry.3) A white solid, ^{1}H NMR (500 MHz, $CDCl_3$): δ 2.4 (s, 3H), 3.50-3.40 (m, 2H), 4.98 (t, 1H), 6.25 (d, J = 7.9 Hz, 2H), 6.90 (br, 1H), 7.1-7.0 (m, 2H), 7.18 (d, 2H), 7.26 (d, 2H),

7.43-7.33 (m, 2H), 7.55-7.46 (m, 1H), 7.92 (d, 2H); FTIR (KBr, cm^{-1}): 3388, 3037, 2923, 1668, 1603, 1505, 1287, 993, 752.



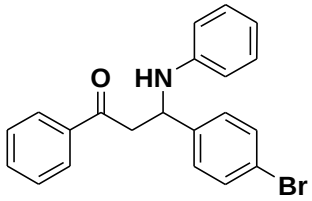
3-(4-Ethylphenyl)-1-phenyl-3-(phenylamino)propan-1-one

(Table.1.Entry.4) A white solid, ^1H NMR (500 MHz, $CDCl_3$): δ 1.3-1.2 (t, J=7 Hz, 3H), 2.72 (m, 2H), 3.49-3.40 (m, 2H), 4.99 (t, 1H), 6.25 (d, J = 7.9 Hz, 2H), 6.78 (m, 1H), 7.2-7.1 (m, 2H), 7.29 (m, 2H), 7.46-7.36 (d, 2H), 7.56-7.46 (m, 1H); FTIR (KBr, cm^{-1}): 3380, 3030, 2932, 1669, 1597, 1507, 1281, 1107, 842, 740, 687, 551.



3-(4-methoxyphenyl)-1-phenyl-3-(phenylamino)propan-1-one

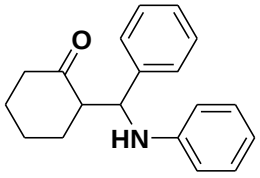
(Table.1. Entry.5) A pale yellow solid, ^1H NMR (500 MHz, $CDCl_3$): δ 3.47-3.41 (b, 2H), 3.79 (s, 3H), 5.01(t, 1H), 6.49 (d, J = 8.1 Hz, 2H), 6.63 (d, 1H), 6.90-6.86 (m, 2H), 7.26 (d, J = 8.0 Hz, 2H), 7.43 (m, 2H), 7.56-7.52 (m, 1H), 7.89 (d, 2H); FTIR (KBr, cm^{-1}): 3396, 3042, 2924, 1662, 1596, 1501, 1282, 752.



3-(4-bromophenyl)-1-phenyl-3-(phenylamino)propan-1-one

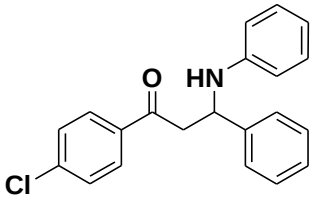
(Table.1.Entry.7) A yellowish solid, ^1H NMR (500 MHz, $CDCl_3$): ^1H NMR (500 MHz, $CDCl_3$): δ 3.58 (br, 2H), 4.99 (t, 1H), 6.50 (d, J = 8.4 Hz, 2H), 6.65 (m, 1H), 6.89-6.96 (m, 2H), 7.15 (t,

2H), 7.32-7.22 (m, 1H), 7.40-7.35 (m, 2H), 7.50-7.46 (m, 1H), 7.56-7.52 (m, 2H); FTIR (KBr, cm^{-1}): 3390, 3047, 1665, 1600, 1280, 1092, 756, 684.



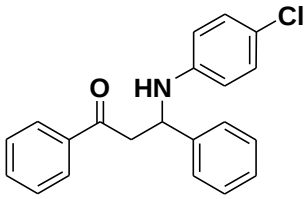
2-(phenyl (phenylamino) methyl) cyclohexanone

(Table.1.Entry.8) A white solid, ^1H NMR (500 MHz, $CDCl_3$): δ 1.80-1.62 (m, 3H), 1.98 (m, 3H), 2.44-2.30 (m, 2H), 2.80-2.74 (m, 1H), 4.62 (d, *J* = 7.4 Hz, 0.99H), 4.81-4.78 (d, 0.16H), 6.56-6.54 (d, 2H), 6.65-6.62 (t, 1H), 7.05-7.01 (t, *J* = 8.0 Hz, 2H), 7.24-7.20 (t, 1H), 7.34-7.30 (m, 2H), 7.58 (d, 2H), 8.16 (d, 2H); FTIR (KBr, cm^{-1}): 3391, 1689, 1088, 762.



1-(4-chlorophenyl)-3-phenyl-3-(phenylamino)propan-1-one

(Table.1. Entry.10) A white solid, ^1H NMR (500 MHz, $CDCl_3$): δ 3.42 (m, 2H), 5.1(s, 1H), 6.25 (d, J = 7.9 Hz, 2H), 6.78 (m, 1H), 7.2-7.1 (m, 2H), 7.29 (m, 2H), 7.46-7.36 (d, 2H), 7.56-7.46 (m, 1H), 7.82 (d, 2H); FTIR (KBr, cm^{-1}) 3386, 3045, 2921, 1668, 1604, 1501, 1289, 759, 619;



3-(4-chlorophenylamino)-1,3-diphenylpropan-1-one

(Table.1.Entry.12) A pale yellow solid, ^1H NMR (500 MHz, $CDCl_3$): δ 3.42 (m, 2H), 5.01 (t, 1H), 6.42 (m, 2H), 6.86 (d, J = 8.1 Hz, 2H), 7.14-7.10 (m, 2H), 7.25 (t, 2H), 7.34-7.29 (m, 2H), 7.42 (m, 2H), 7.86 (d, 2H); FTIR (KBr, cm^{-1}): 3380, 2921, 1670, 1599, 1279, 1085, 756, 616.