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Table 1 Synthesis of 2-amino-3-furonitriles under solvent-free conditions^a

Entry	α -Haloketone 1	2-Amino-3-furonitrile 3	Isolated yield/%	M.p./°C ^b	
				Found	Lit. ^{ref}
a			80	200–201	200 ²³
b			75	213–215	214–215 ²⁴
c			70	218–220	220–222 ²⁴
d			85	224–225	24–226 ²⁴
e			90	229–230	228–229 ²⁴
f			65	200–201	–
g			70	155–157	158 ²³
h			60	154–156	156–158 ²⁵

^aThe products were characterised by comparison of their IR and ¹H NMR spectroscopic data and their melting points are compared with reported values.

^bIn all cases the products melt with decomposition.

Experimental

The melting points were recorded on an Electrothermal type 9100 melting point apparatus. The IR spectra were obtained on a 4300 Shimadzu Spectrometer. The ¹H NMR (100 MHz) spectra were recorded on a Bruker AC 100 spectrometer. The mass spectra were scanned on a Varian Mat CH-7 instrument at 70 eV. Elemental analyses was obtained on a Thermo Finnigan Flash EA microanalyser.

General procedure for the synthesis of 2-amino-5-aryl(alkyl)-3-furonitriles (**3a–h**)

A mixture of phenacyl bromide derivatives (**1a–h**) (2 mmol), malononitrile (0.13 g, 2 mmol), SiO₂ (1.0 g) and diethylamine (0.44 g, 6 mmol) was ground in a mortar for 15 min. After the completion of the reaction (monitored by TLC CHCl₃:CH₃OH 9:1), the reaction mixture was washed with chloroform (30 ml). The organic layer was washed with water (2 × 30 ml), dried over MgSO₄ and evaporated. The crude product was recrystallised from ethanol to give compounds (**3a–h**) in 60–90% yields. The 2-amino-5-aryl(alkyl)-3-furonitriles (**3a–e** and **3g–h**) prepared are known compounds and were characterised by comparison of their physical and spectral data with those reported in the literature.^{8–14, 23–25}

2-Amino-5-(3-nitrophenyl)-3-furonitrile (3f): Compound **3f** was obtained in 65% yield; yellow solid; m.p. 200–201 °C; IR (KBr, ν_{max} /cm⁻¹): 3400 (NH), 3320 (NH), 2200 (CN), 1650 (NH₂), 1530 (NO₂), 1350 (NO₂). ¹H NMR (DMSO-d₆, 100 MHz) δ : 6.95 (s, 1H, Furan H), 7.55 (t, 1H, *J* = 8 Hz, ArH-H₅), 8.05 (td, 1H, *J*₁ = 8 Hz, *J*₂ = 1.5 Hz, ArH-H₆), 8.15 (td, 1H, *J*₁ = 8 Hz, *J*₂ = 1.5 Hz, ArH-H₄), 8.25 (t, 1H, *J* = 1.5 Hz, ArH-H₂), 8.40 (br s, 2H, NH₂). MS: *m/z* 229 (M⁺, 45), 194 (35), 183 (25), 125 (55), 107 (63), 93 (71), 77 (100), 65 (45). Found: C, 57.42; H, 2.97; N, 18.64. Calcd for C₁₁H₇N₃O₃ (229): C, 57.65; H, 3.08; N, 18.33%.

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