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### PREPARATION OF 1-(*o*-AMINO BENZOYL)-1-METHYLHYDRAZINES

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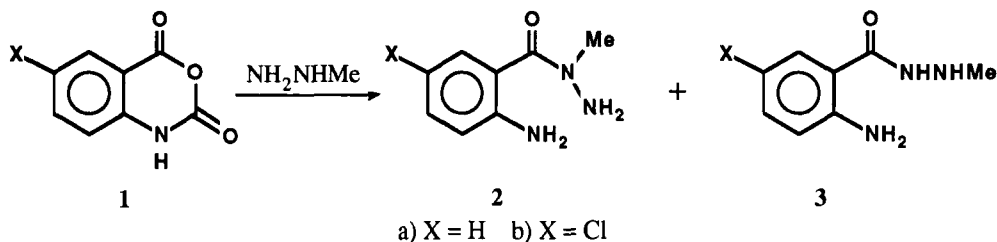
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PREPARATION OF 1-(*o*-AMINO BENZOYL)-1-METHYLHYDRAZINES

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2-Aminobenzoylhydrazines are important starting compounds for the synthesis of various heterocycles. With oxo reagents for example, quinazolines, oxadiazoles or benzotriazepinones are formed depending on the reagent and conditions used.<sup>1</sup> The easiest method for the preparation of 2-aminobenzoylhydrazines is the treatment of isatoic anhydrides<sup>2</sup> with hydrazines. When monoaryl or acetylated hydrazines are used, 2-(*o*-aminobenzoyl)-1-substituted hydrazines (**3**) are formed.<sup>2,3</sup> With methylhydrazine, the main product is of type **2** since the methyl group increases the basicity of the substituted nitrogen. Sunder *et al.*<sup>4</sup> reported that the ring opening of isatoic anhydride with



methylhydrazine in dry DMF resulted in an 85:15 mixture of **2a** and **3a**, whereas Leiby and Heindel<sup>5</sup> stated that the same reaction and the ring opening of 5-chloroisatoic anhydride (**1b**) in 95% ethanol resulted in **2b** and **3b**, respectively, as the sole products. Both groups of authors described the products as oils which were used in different reactions.<sup>6</sup> When these experiments were repeated under the reported conditions, the <sup>1</sup>H NMR (400 MHz) spectra showed the distilled oily products to be 9:1 mixtures of **2**:**3**. When diethyl ether was added to these oils, **2** crystallized (**2b** rapidly and **2a** more slowly). After two recrystallizations, the isomer-free **2a** and **2b** were obtained. From the mother liquor of **2a**, the minor product **3a** was separated by means of TLC. The products were stable at room temperature.

## EXPERIMENTAL SECTION

Melting points were determined in capillary tubes with an Electrothermal Digital Melting Point apparatus and are uncorrected. <sup>1</sup>H NMR spectra were recorded on a JEOL GX 400 FT NMR spectrometer in CDCl<sub>3</sub> with TMS as internal standard. MS spectra were obtained on an MM 7070E mass spectrometer at 70 eV.

Reaction of Isatoic Anhydrides (**1a** or **1b**) with Methylhydrazine.- To a slurry of isatoic anhydride (0.1 mol) in ethanol (100 ml), methylhydrazine (6 g, 0.13 mol) was added over a 5 min period. A

clear solution was obtained with concurrent evolution of carbon dioxide. After stirring for 4 hrs, the solvent was evaporated and the residue was distilled at 170-185° (1 mm) to afford a 9:1 mixture of **2:3**. The oily product was dissolved in ether (100 ml) and left to stand overnight at 4°. The isomer-free product (**2a** or **2b**) was collected and recrystallized.

**2a**: 10.0 g, (60%), mp. 71-73° (3:1 diisopropyl ether-ethanol). <sup>1</sup>H NMR (CDCl<sub>3</sub>): δ 3.24 (s, 3H, CH<sub>3</sub>), 4.50 (s, 4H, 2 x NH<sub>2</sub>), 6.70-6.74 (m, 2H, Ar), 7.13-7.20 (m, 2H, Ar). MS (EI): m/z(%) 165(22), 120(100), 92(32), 65(7).

Anal. Calcd for C<sub>8</sub>H<sub>11</sub>N<sub>3</sub>O: C, 58.16; H, 6.71; N, 25.44. Found: C, 58.24; H, 6.86; N, 25.39

**2b**: 13.2 g (66%), mp. 82-84° (9:1 diisopropyl ether-ethanol). <sup>1</sup>H NMR (CDCl<sub>3</sub>): δ 3.25 (s, 3H, CH<sub>3</sub>), 4.47 (s, 4H, 2 x NH<sub>2</sub>), 6.65-6.67 (m, 1H, Ar), 7.13-7.20 (m, 2H, Ar). MS (EI): m/z (%) 199(24), 154(100), 126(26), 99(12).

Anal. Calcd for C<sub>8</sub>H<sub>10</sub>ClN<sub>3</sub>O: C, 48.13; H, 5.05; N, 21.05. Found: C, 48.20; H, 5.12; N, 20.96

From the mother liquor obtained from the purification of **2a**, separation on a preparative TLC plate (Merck) with 4:1 benzene-ethanol gave small amounts of **3a** as white crystals, mp. 90-91° (hexane), lit.<sup>6</sup> mp. 90-91°. <sup>1</sup>H NMR (CDCl<sub>3</sub>): δ 2.71 (s, 3H, CH<sub>3</sub>), 5.47 (s, 3H, NH and NH<sub>2</sub>), 6.63-6.70 (m, 2H, Ar), 7.20-7.30 (m, 2H, Ar), 7.60 (s, 1H, NHCH<sub>3</sub>). MS(EI): m/z(%) 165(22), 136(5), 120(100), 92(37), 65(28).

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