

## Product Information

### 3-ISOBUTYL-1-METHYLXANTHINE Sigma Prod. Nos. I5879 and I7018 Storage temperature - 20°C

**CAS NUMBER:** 28822-58-4

**SYNONYMS:** IBMX, MIX, MeiBu-Xan<sup>14</sup>, IBX

#### PHYSICAL DESCRIPTION:

Appearance: White powder

Molecular formula: C<sub>10</sub>H<sub>14</sub>N<sub>4</sub>O<sub>2</sub>

Molecular weight: 222.2

Melting point: Approximately 201°C (∇ 1°C)<sup>1</sup>

E<sup>m</sup><sub>M</sub>(275-276 nm) = 11.4-11.9 (0.001 M NaOH)<sup>1</sup>

#### STORAGE / STABILITY AS SUPPLIED:

Sigma recommends storing IBMX at -20°C. IBMX is considered stable at room temperature.<sup>2</sup>

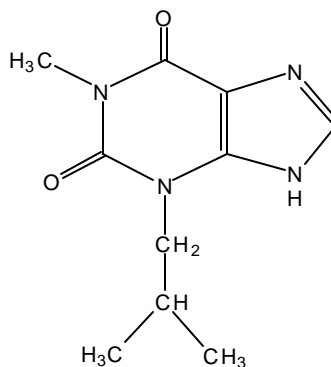
#### SOLUBILITY / SOLUTION STABILITY:

IBMX is tested at 50 mg/mL in warm methanol. It is readily soluble in ethanol at 10 mg/mL, but dissolves at 25 mg/mL only with sonication.<sup>1,5</sup> It is soluble in 100% DMSO at 1 M with gentle warming.<sup>3</sup> A 10 mM aqueous solution can be prepared by warming the mixture in a boiling water bath.<sup>4</sup>

Solutions are stable for at least three months in ethanol (0.125 mg/mL) at 4°C.<sup>5</sup> Aqueous solutions can be frozen in aliquots, then thawed for use by heating in a boiling water bath. These aliquots are stable for several months.<sup>4</sup> Solutions in DMSO should be equally stable at -20°C.

#### USAGE REMARKS:

A number of methylxanthines, including caffeine and theophylline, will inhibit adenosine 3',5'-cyclic monophosphate phosphodiesterase (cAMP PDE).<sup>6</sup> IBMX has been shown to be a potent inhibitor of cAMP PDE, significantly more effective than theophylline.<sup>7-11</sup> IBMX inhibits cyclic nucleotide PDE with subsequent inhibition of cyclic nucleotide hydrolysis, resulting in accumulation of cyclic AMP and guanosine 3',5'-cyclic monophosphate.<sup>12,13</sup> In a study of cyclic AMP and insulin release by islets of Langerhans, IBMX at 1 mM caused a marked increase in the intracellular concentration of cyclic AMP in the presence of glucose.<sup>9</sup>



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**USAGE REMARKS:**

Caffeine and theophylline stimulate lipolysis in fat cells. IBMX was 20-fold more effective than theophylline, used at 0.05 mM.<sup>8</sup> IBMX has been shown to promote the conversion of fibroblast cells into adipose cells, apparently without altering the amount of bromodeoxyuridine (BrdU) present in the DNA of the cells.<sup>14</sup>

As a PDE inhibitor, IBMX was shown to inhibit the growth of carcinoma cells both *in vivo* and *in vitro* in mice.<sup>15</sup>

I5879 is the reagent grade; I7018, SigmaUltra, has been subjected to additional testing for trace metal impurities.

**REFERENCES:**

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