

## Product Information

### PROSTAGLANDIN E<sub>1</sub>

Product Number **P5515**

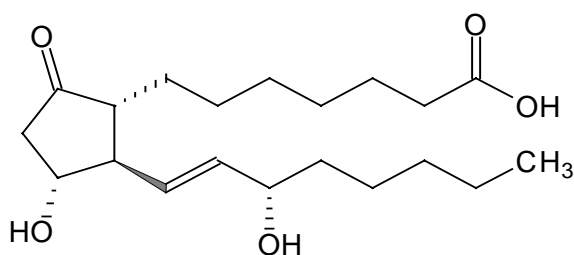
Storage Temperature -0°C

CAS #: 745-65-3

Synonyms: Alprostadil; [11 $\alpha$ , 13E, 15S]-11,15-

Dihydroxy-9-oxoprost-13-enoic acid

### Product Description



Appearance: Powder ranging in color from white to white with a faint yellow cast<sup>1</sup>

Molecular formula: C<sub>20</sub>H<sub>34</sub>O<sub>5</sub>

Molecular weight: 354.5

Melting point: 115-117°C<sup>2</sup>

Optical rotation: -61.6° (c = 0.56% (w/v) in

Tetrahydrofuran for 578 nm spectral line.)<sup>2</sup>

"Prostaglandins are a family of fatty acid derivatives which have a variety of potent biological activities of a hormonal or regulatory nature. The name prostaglandin was first given in the 1930's by the Swedish physiologist U. S. von Euler to a lipid-soluble acidic substance found in the seminal plasma, the prostate gland and the seminal vesicles. In very small amounts this material was found to lower blood pressure and to stimulate certain smooth muscles to contract. At least 14 prostaglandins occur in human seminal plasma, and many others have been found in other tissues or prepared synthetically in the laboratory."<sup>3</sup> "Prostaglandin E<sub>1</sub> is a vasodilator and inhibitor of platelet aggregation. It is mainly used to maintain the patency of the ductus arteriosus in neonates with congenital heart disease until surgery is possible."<sup>4</sup> Prostaglandin E<sub>1</sub> has been used for the treatment of erectile dysfunction<sup>5</sup> and was found upon its addition to heparin to enhance "the degree of anticoagulation as measured by reduced thrombin formation during cardiopulmonary bypass".<sup>6</sup>

### Precautions and Disclaimer

Prostaglandin E<sub>1</sub> is considered toxic and may impair fertility.<sup>7</sup>

### Preparation Instructions

Sigma dissolves this product in acetone at 10 mg/ml with a resulting clear, colorless solution.<sup>1</sup> Prostaglandin E<sub>1</sub> is reported soluble in ethanol at >100 mg/ml. "It is recommended that a stock solution of 10 mg/ml in ethanol be prepared and that aliquots be further diluted with 0.1 M phosphate buffer to achieve the desired concentration. Make dilutions slowly to avoid crystallization of the prostaglandin. Should the phosphate ion be objectionable, the ethanol stock solution may be alternatively diluted with sodium carbonate solution (20 mg Na<sub>2</sub>CO<sub>3</sub> in 100 ml distilled water). The amount of Na<sub>2</sub>CO<sub>3</sub> used should not exceed the amount required to exactly neutralize the prostaglandin acid. For 1 mg of prostaglandin E<sub>1</sub> use 0.7 ml of the sodium carbonate solution. Direct preparation of an aqueous solution of prostaglandin E<sub>1</sub> is difficult to achieve and is not recommended."<sup>8</sup> It is reported that prostaglandin E<sub>1</sub> is soluble at approximately 7.5 ug/ml in water at 25°C.<sup>9</sup>

Prostaglandin E<sub>1</sub> in ethanol at 10 mg/ml is stable for longer than 6 months at -20°C.<sup>8</sup> Prostaglandins are generally unstable in aqueous acid or alkaline solutions. Prostaglandin E<sub>1</sub> has a maximum stability between pH 6-7.<sup>2</sup> When aqueous solutions are frozen, the prostaglandin may precipitate but it will usually redissolve on shaking or if necessary with brief ultrasonication.<sup>8</sup>

The use of plastic tubes should be avoided when working with dilute aqueous concentrations of prostaglandins. If the tube's surface is rough and irregular on a microscale, a hydrophobic interaction similar to the interaction in reverse phase chromatography takes place with some loss of material due to attachment to the surface. Teflon is suitable to use since it has a smooth surface.<sup>10</sup>

### Storage/Stability

Prostaglandin E<sub>1</sub> is sensitive to light and comes packaged under argon gas. Product should be stable for at least one year when stored under argon and desiccated at -20°C.

**References**

1. Sigma quality control data.
2. Data for Biochemical Research Research, 3rd ed. (Oxford Press, 1986), 346-347.
3. Biochemistry, 2nd ed., Albert L. Lehninger (Worth Publishers, 1978), p. 300.
4. Martindale The Extra Pharmacopoeia, 31st ed., James E.F. Reynolds, Ed. (Royal Pharmaceutical Society, 1996), p. 1450-3.
5. Milewczyk P. et al., Ginekol Pol, 69(7), 598 (1998).
6. Kozek-Langenecker S.A., et al., Anesth Analg, 87(5), 985 (1998).
7. Material Safety Data Sheet (MSDS)
8. Supplier's information.
9. Methods in Enzymology, 86, 437 (1982).
10. Sigma Data.

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