Lisinopril 1-mg/mL Oral Liquid

Rx

For 100 mL		
Lisinopril tablets		100 mg
Ora-Plus		50 mL
Ora-Sweet	qs	100 mL

METHOD OF PREPARATION

1. Calculate the required quantity of each ingredient for the total amount to be prepared.
2. Count out the required number of tablets.
3. Pulverize the tablets to a fine powder in a suitable mortar.
4. Add a small quantity of Ora-Plus and mix to form a smooth paste.
5. Add the remainder of the Ora-Plus geometrically and mix well.
6. Add the Ora-Sweet to volume and mix well.
7. Package and label.

PACKAGING

Package in tight, light-resistant containers.[1]

LABELING

Keep out of reach of children. Use only as directed. Shake well.

STABILITY

A beyond-use date of 90 days is appropriate for this preparation.[1,2]

USE

Lisinopril oral liquid has been used in the treatment of hypertension or congestive heart failure in children.

QUALITY CONTROL

Quality-control assessment can include weight/volume, pH, specific gravity, active drug assay, color, rheological properties/pourability, physical observation, and physical stability (discoloration, foreign materials, gas formation, mold growth).[3]

DISCUSSION

Lisinopril ($C_{21}H_{31}N_3O_5.2H_2O$, MW 441.52) is an angiotensin-converting enzyme (ACE) inhibitor, which acts as an inhibitor of the renin-angiotensin-aldosterone system in the treatment of cardiovascular disorders. It is used alone or in combination with other classes of antihypertensive agents in the management of mild to severe hypertension. It occurs as a white, crystalline powder that melts at about 160°C with decomposition. It is soluble in water and practically insoluble in alcohol.[1]

In a published stability study, lisinopril was investigated in two vehicles: a combination of Ora-Plus and Ora-Sweet and a combination of methylcellulose 1% and Simple Syrup NF (1:13) at both 4° and 25°C. Lisinopril was stable in the methylcellulose-simple syrup combination for 91 days at 4°C but for only 56 days at 25°C. The pH values of about 4.8 for the Ora-Plus:Ora-Sweet combination and 6.7 for the methylcellulose:syrup combination did not change during the study.[2]

Lisinopril is commercially available in 2.5-mg, 5-mg, 10-mg, 20-mg, 30-mg, and 40-mg strengths; brand names include Zestril and Prinivil. Prinivil tablets also contain calcium phosphate, mannitol, magnesium stearate, and starch. The 10-mg, 20-mg, and 40-mg tablets also contain iron oxide. Zestril tablets also contain calcium phosphate, magnesium stearate, mannitol, and starch in the 2.5-mg tablets. The 5-mg, 10-mg, 20-mg, and 30-mg tablets contain calcium phosphate, magnesium stearate, mannitol, red ferric oxide, and starch; the 40-mg tablets contain calcium phosphate, magnesium stearate, mannitol, starch, and yellow ferric oxide.[4]

Ora-Plus is an oral suspending vehicle that accepts dilution of up to 50% or more with water, flavoring agents, or syrups and still retains its suspending properties. It has a pH of approximately 4.2 and an osmolality of about 230 mOsm/kg. It is a thixotropic vehicle with a viscosity of approximately 1,000 cps at 25°C. It contains purified water, microcrystalline cellulose, sodium carboxymethylcellulose, xanthan gum, and carrageenan; sodium phosphate and citric acid as buffering agents; simethicone as an antifoaming agent; and potassium sorbate and methylparaben as preservatives.[5]

Ora-Sweet syrup is a flavoring vehicle for oral extemporaneous preparations. It is flavored with a citrus-berry flavor blend and contains glycerin and sorbitol to prevent "cap-lock," a problem associated with many syrups. It is buffered to a pH of approximately 4.2 and has an osmolality of about 3,240 mOsm/kg. It contains purified water, sucrose, glycerin, sorbitol (5%), and flavoring; sodium phosphate and citric acid as buffering agents; and potassium sorbate and methylparaben as preservatives.[6]

References

1. United States Pharmacopeial Convention, Inc. *USP Pharmacists' Pharmacopeia.* Rockville, MD: US Pharmacopeial Convention, Inc.; 2005: 198, 408–413, 693.
2. Nahata MC, Morosco RS. Stability of lisinopril in two liquid dosage forms. *Ann Pharmacother* 2004; 38(3): 396–399.
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4. [No author listed.] *Physicians' Desk Reference.* 60th ed. Montvale, NJ: Thomson PDR; 2006: 704, 2029.
5. Ora-Plus [product information]. Minneapolis, MN: Paddock Laboratories, Inc.
6. Ora-Sweet [product information]. Minneapolis, MN: Paddock Laboratories, Inc.