Short Communication

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MOISTURE CONTENT OF ASCORBIC ACID TABLETS STORED AT VARIOUS TEMPERATURES AND HUMIDITIES

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INTRODUCTION

Ascorbic acid undergoes extensive deterioration and discoloration in the presence of trace amounts of moisture[1]. The stability of ascorbate salts stored at 37°C and 100% relative humidity is less than the free acid [2]. The rate of moisture adsorption may be the rate determining step in the degradation of drugs in solid dosage forms[3]. The stability ratio and the moisture uptake of tablets in closed containers have been used to evaluate the packaging methods[4 and 5]. We wish to report the moisture content of some commercial ascorbic acid tablets stored at different temperatures and relative humidities.

Ten commercial brands of ascorbic acid tablets were procured directly from the manufacturers and stored at 25 , 40 and 45°C for six months in the presence of artificially created humidity (75% ± 1) and (100% ± 1). The moisture content (referred to dry substance) was determined by an Ultra X Infra-red Moisture Tester.

The general pattern of variations in the moisture content of various samples with time, exhibited a gradual increase both at 75%± 1 and 100% ± R.H. The samples stored at 25°C (75% R.H.) in general showed an increase in the moisture content at the end of six months. It was less than those stored at 40°C (75% R.H.) and more than those stored at 54°C (75% R.H.). This suggests that at higher temperatures (75% R.H.), when the air present in the interspacial area of the tablets is expelled, the high content of water vapours would occupy interspaces and hence would result in higher moisture content. The % moisture content in samples stored at 40° and 45°C (100 % ± 1 R.H.) was higher than those stored at 75% R.H., due to higher aqueous tension. This indicates that the tablet ingredients have a higher tendency to absorb moisture because of their specific chemical nature, microcrystalline form and particle size.

The commercially packed containers for samples 1, 2 and 6 were provided with silica gel bags in addition to a paraffin or rubber wad at the mouth of container, for protection from moisture, while the rest of the samples were stored without such provision. Hence in the later case more deterioration from moisture uptake might be expected. However, it was observed at 40°C (75% R.H.) and 45°C (100% R.H.) that metallic closures for samples 2, 4 and 6 showed signs of rustiness which would indicate that such closures on prolonged storage may deteriorate and thus, be ineffective in providing an adequate moisture barrier.

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