

## DETERMINATION OF SUN PROTECTION FACTOR OF ECOFRIENDLY FORMULATED SUNSCREEN LOTION

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### Abstract

*The present research demonstrate the Ecofriendly formulation of sunscreen lotion containing biologically synthesized nanoparticles in it and to compare its effectiveness with the sunscreen lotion without silver nanoparticles and other sunscreen lotion available in the market.*

**Key words:** Silver Nanoparticles, Ecofriendly formulated sunscreen lotion. SPF Value.

### Introduction

Nanotechnology is growing rapidly it has a vast application in biomedicine food and Engineering due to the small particles size of nanoparticles and greater availability of surface area. Some important characteristics of nanoparticles made its application more advantageous such as biocompatibility, high productivity and safety and its cost effectiveness<sup>1</sup>. Silver nanoparticles show wide Varsity of application in dermatology. Moreover the sunscreen lotion prepared by chemical compounds is very costly and less effective to the high temperature. In view of this an attempt has been made to synthesized Ecofriendly sunscreen lotion containing plants extract and to these biologically<sup>2</sup> prepared silver nanoparticles was added to it to increase its effectiveness.

### Experimental

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software (BI/CI/SP/SB-S-03) of Bio Era make. Size of silver nanoparticles was calculated by using XRD.

### Method and Material

#### Formulation of Ecofriendly sunscreen Lotion

Sunscreen lotion is prepared by using extract of different biological material in the following proportion.

### Biological Synthesis of Silver Nanoparticles from Silver Nitrate solution<sup>3</sup>

Silver nanoparticles were synthesized from silver nitrate solution. 500 gm Mushroom was first dried and mushroom extract was collected. This mushroom extract was added to the 10ml of 0.1M AgNO<sub>3</sub> solution. After few second the color of silver nitrate solution was change and synthesized silver Nanoparticles were separated.

### Formulation mixed Ecofriendly of Silver nanoparticles silver nanoparticles

This separated AgNPs were blended with Ecofriendly sunscreen lotion. And the solution was kept for 24 Hrs.

### Calculation of Sun Protection Factor<sup>4,5</sup>:

Sun protection factor is calculated by the following formula

SPF = minimal erythema dose in sunscreen protected skin/ minimal erythema dose in non Sunscreen-protected skin.

Minimal erythema dose is defined as the lowest time interval or dosage of UV light irradiation sufficient to produce a minimal, perceptible erythema on unprotected skin. The highest the SPF, the more effective is the product in preventing sunburn.

SPF (Spectrophotometry) =  $CF \times \sum EE(\lambda \times I(\lambda) \times Abs(\lambda))$

Where EE = erythema effect spectrum, I = Solar intensity spectrum; Abs = Absorbance of sunscreen product; CF = Correction Factor = 10. The value of EF X I are constant

Wavelength ( $\lambda$ nm)	EF X I (normalized)
290	0.015
295	0.081
300	.287
305	0.327
310	0.186
315	0.083
320	0.018

### SPF of formulated sunscreen and other market available product:

Sr. No.	Commercial Sample	SPF
1	Commercial sample-1	28
2	Commercial sample-2	31
3	Experimental sample	33

### Conclusion

The newly formulated sunscreen lotion by using silver nanoparticles was found to exhibit a number of promising properties and attributes that might open new opportunities for the development of more efficient. Safe and cost effective sunscreen lotion.

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