

# EFFECTS OF NEAR INFRARED TREATMENT ON ELECTROPHORETIC PATTERNS OF SOYBEAN SAMPLES



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## INTRODUCTION

Soybean is an important source of proteins with high nutritional value and good functional properties in food applications. However, the utilization of soybean is limited because of the presence of undesirable components (e.g. trypsin inhibitor, lipoxygenase). Some food processing methods such as cooking, microwave and roasting, can be used to reduce the undesirable components. But the processing parameters must be designed carefully in order to avoid reductions in amounts of constituents having importance in nutrition and health. In recent years, there has been an increasing trend towards the utilization of infrared (IR) in the food industry due to its advantages. It is an efficient and energy saving food processing technology due to the characteristics such as thermal efficiency, fast heating rate/response time, wavelength and direct heat penetration into the product.

The aim → to investigate the effects of infrared treatment on soybean proteins, by using SDS-PAGE.

## MATERIALS AND METHODS

**Soybean samples**  
(cv. Adasoy, cv. Nazlıcan)

soaking in water (7/40; w/v) for

- 30 min
- 45 min



**Infrared powers**

- 814W
- 1003W
- 1208W
- 1342W

applied for

- 10 min
- 15 min



- 12 halogen lamps each having 150W
- Two aeration channel (12 volt each)
- Lamps were set 20 cm above the tray

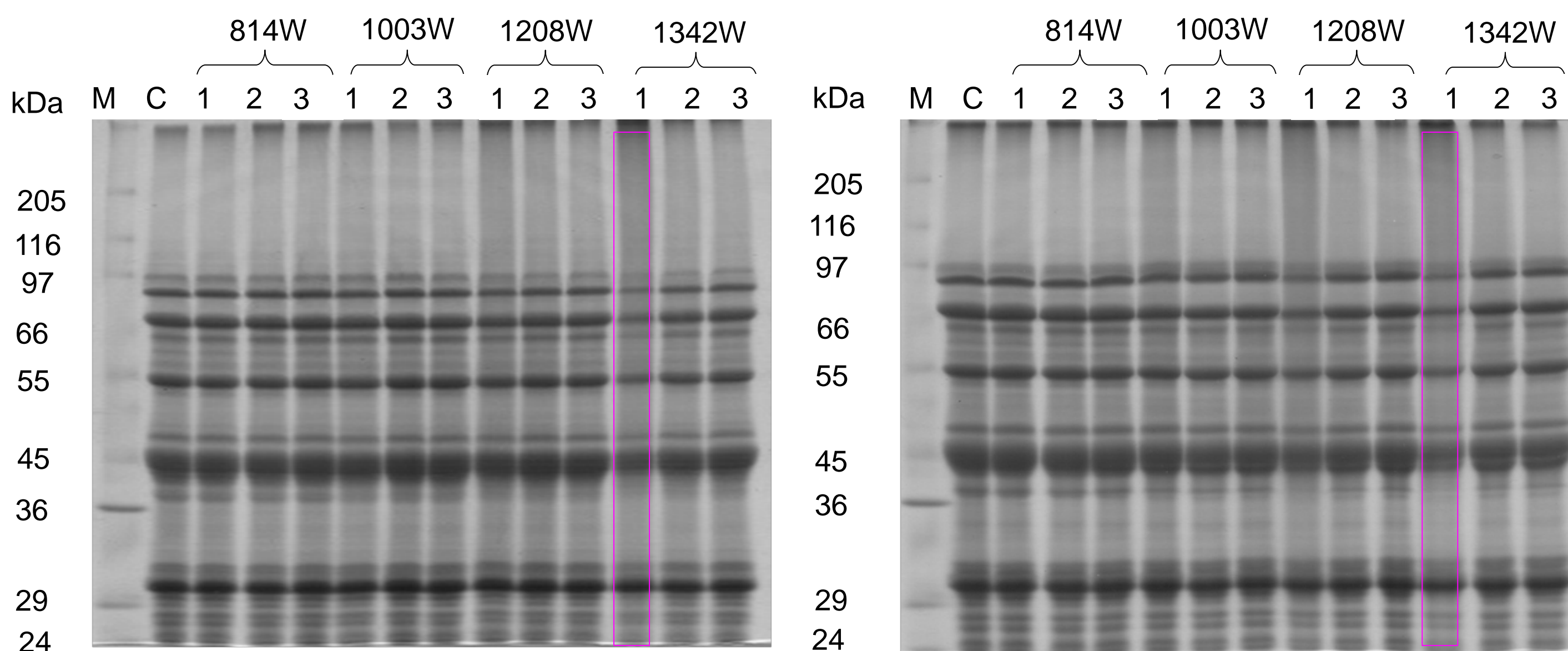
**Analyses of soybeans**

- SDS-PAGE (Ng and Bushuk, 1987)
- Densitometric analysis was carried out by using TotalLab TL100 (Nonlinear Dynamics, USA).

## RESULTS AND DISCUSSION

**cv. Adasoy**

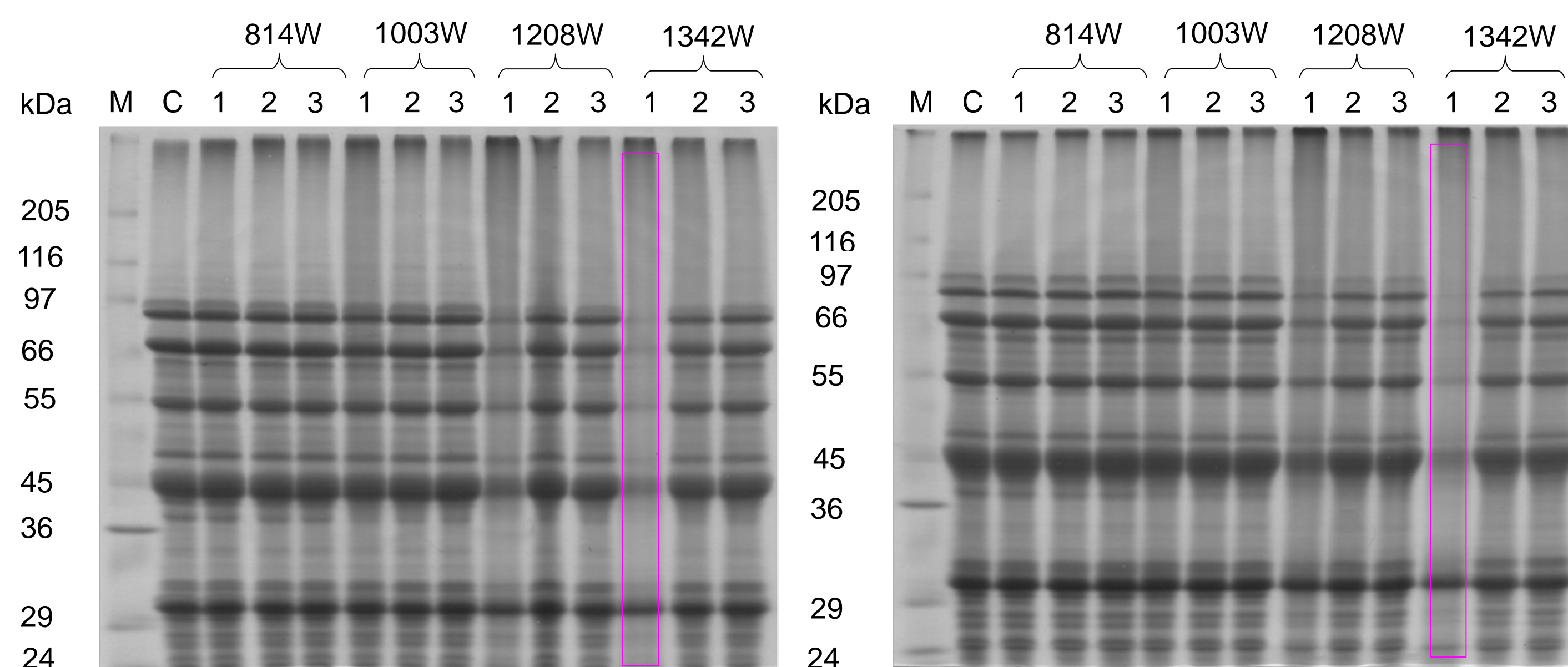
**cv. Nazlıcan**



**Fig. 1.** SDS-PAGE patterns of infrared-treated (10 min) soybean samples (M:protein marker, C:control soybean) 1: unsoaked soybean 2: soybean soaked for 30 min., 3: soybean soaked for 45 min

Both densitometric results and visual evaluation of the SDS-PAGE patterns indicated that infrared treatment caused decreases in relative band intensities of the soybean samples.

IR power ↑  
IR time ↑  
Relative band intensities ↓  
(MW: 97-29 kDa)



**Fig. 2.** SDS-PAGE patterns of infrared-treated (15 min) soybean samples (M:protein marker, C:control soybean) 1: unsoaked soybean 2: soybean soaked for 30 min., 3: soybean soaked for 45 min

The effect of infrared treatment on proteins of the unsoaked soybean samples was more pronounced as compared to those of the soaked soybean samples.

### References:

Ng PKW, Bushuk W. (1987) Glutenin of Marquis wheat as a reference for estimating molecular weights of glutenin subunits by sodium dodecyl sulfate-polyacrylamide gel electrophoresis. Cereal Chem 64:324-327.

### Acknowledgment:

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