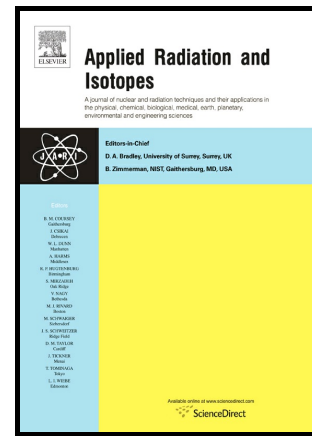


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# Excitation function of proton induced nuclear reaction on strontium: special relevance to the production of $^{88}\text{Y}$

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## ABSTRACT

Excitation functions were measured by the activation method using stacked-foil technique for the  $^{nat}\text{Sr}(p, xn)^{88,87m,g,86m,g}\text{Y}$  reactions up to 18 MeV. The experimental results were compared with the theoretical data from EMPIRE-3.2 code and TENDL.

Integral yields of  $^{88,87m,g,86m,g}\text{Y}$  were estimated based on the measured cross sections. The optimum energy range for the production of the important isotope  $^{88}\text{Y}$  is  $E_p = 16 \rightarrow 11$  MeV,  $^{88}\text{Y}$  yield amounts to about 3 MBq/ $\mu\text{Ah}$ .

**Keywords:** *Excitation Function/ Stacked-Foil Technique/ Natural Strontium Targets/ Nuclear Model Calculations/ Integral Yield.*

## 1. Introduction

The positron emitting  $^{86}\text{Y}$  ( $T_{1/2} = 14.7$  h,  $\beta^+$  (33%),  $E_{\beta^+} = 1.2$  MeV) has proved to be used in Positron Emission Tomography (PET). For its production several nuclear processes were considered and the reaction  $^{86}\text{Sr}(p, n)^{86}\text{Y}$   $E_{th}=6$  MeV was found to be most suitable (Rösch et al. 1993b; Sadeghi et al. 2009), because it could be used at a small-sized cyclotron. Many studies were done by Rösch et al. (Rösch et al. 1993a) to produce

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