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Characteristics of the new IPEN-CNEN/SP PSD Neutron Diffractometer

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The neutron powder diffractometer recently installed at the IPEN-CNEN/SP IEA-R1 research reactor is equipped with a position sensitive detector (PSD). The PSD spans 20° of a diffraction pattern with a quite good resolution and an extended powder diffraction pattern can be obtained in 20° segments in a 2θ interval ranging from 5 to 125° . A focusing Si monochromator and a rotating-oscillating collimator (ROC) were also installed in the new instrument. At a take-off angle of 84° , the following reflections/wavelengths(\AA) can be easily attained with the new monochromator: $533/1.111$, $511/1.399$, $331/1.667$ and $311/2.191$. The ROC, installed at the entrance to the detector shield, eliminates parasitic scattering from furnace or cryorefrigerator heat shields and makes the PSD less sensitive to ambient background. Details of the construction of the new instrument, as well as several neutron powder patterns, obtained with different compounds, will be presented in order to give an idea of the quality of the new instrument. Use of the IPEN-CNEN/SP PSD neutron diffractometer is open to the scientific and technological communities from Brazil and other Latin-American countries. The authors acknowledge the financial supports given by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP - project no. 95/05173-0) and Ministério da Ciência e Tecnologia (MCT - project no. 62.0007/98-2).