Study of Stopping Sites of B12 Nuclei Implanted in Hexagonal Single-Crystals

Francis David Correll

Richard C. Haskell
*Harvey Mudd College*

Leon Madansky
*Johns Hopkins University*

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thicknesses of 100-500 keV and the γ-rays were detected with a 100-cm−2 polyethylene detector with anticoincidence shielding. Preliminary results for the excitation function taken between $E_γ = 31$ and 35 MeV shows that the radiative width of the 16.9 MeV state is somewhat larger than that of the 15.6 MeV state. This result is discussed in terms of the isospin mixing between the two levels. Also, a preliminary result has been determined for the total radiative width integrated over the two states. The implications for the Conserved Vector Current theory of weak interactions will be discussed.

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AF 4  Resonance Fluorescence of 3 Levels in $^{11}B$, T. J. LENIS, Univ. of Pittsburgh, B. WESSELLS and W. C. MILLER, Univ. of Notre Dame--Resonant scattering of x-rays has been observed from excited states of the target. *Supported by National Science Foundation.

AF 5  Quadrupole Couplings of $^{12}N$ implanted in Single Crystals of $Be$ and Mg, R. C. HASKELL, D. O. CORRELL and L. MADANSKY, The Johns Hopkins University--Measurements have been made of the quadrupole couplings of $^{12}N$ implanted in single crystals of $Be$ and Mg. A comparison of these couplings suggests that the final stopping sites of the implanted $^{12}N$ ions are substitutional sites in both $Be$ and Mg, i.e., the $^{12}N$ ions occupy metal ion lattice positions. The $^{12}N$ ions implanted in both $Be$ and Mg have the same charge state and quadrupole shielding factor. A procedure is outlined for deducing $Q(12N)$ and the reliability of this procedure is discussed.

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AF 6  Beta Decay of $^{14}B$, D. E. ALBURGER and D. K. GOOSMAN, Brookhaven National Laboratory--A target of $BeO$ enriched to 98% in $^{12}Be$ has been bombarded with 31-MeV $^3He$ ions and delayed activities were measured by means of a fast beam chopper and a NaI(Tl)-plastic γ-coincidence detecting system. γ-rays of 1.0, 2.1, 3.7, 4.4, and 6 MeV were observed in coincidence with g-rays, the first four corresponding to the known activities $^{24}Na$, $^{13}Be$, $^{13}B$, and $^{14}B$, respectively. The 6-MeV γ-rays are in coincidence with g-rays having $E_{max} > 12$ MeV decaying with half-lives of 1.4, 3.3, and 3.3 sec (preliminary values). This activity is assigned to $^{14}B$ produced in the $^{13}Be(g,n)p^3\alpha$ reaction. It is shown that $^{14}B$ has odd parity consistent with shell-model expectations, although the γ-ray branches to the odd-parity excited states of $^{12}C$ need further clarification. Work is also continuing in an effort to produce a greater yield of $^{14}B$ via the $^{12}Be(g,n)p^3\alpha$ reaction.

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AF 7  $^{16}O(\gamma,p)^{15}O$ and $^{16}C(\gamma,p)^{15}C$ ($\gamma$ = 1.98 MeV)

for $E_\gamma = 4.1$-6.1 MeV. R. ALMANZA and C. MURILLO, Instituto Nacional de Energia Nuclear, Mexico, and S. B. DARDEN, S. BEN, AND W. A. YOH, University of Notre Dame--Vector-analysis power measurements have been made for $^{15}O(p,p')^{15}O$ and for $^{15}O(p,p')^{15}O$ ($\gamma$ = 1.98 MeV) to augment cross-section data already obtained and permit a more complete analysis in terms of levels. A gas target with an energy spread of approximately 0.5 MeV was used. Data were taken for eighteen angles between 32.5° and 150° lab in 25-kv steps over the range $E_\gamma = 4.1$ - 6.1 MeV. Analysis of the data is in progress and preliminary results will be presented.

Research supported in part by the National Science Foundation.

AF 8  A Study of the Stopping Sites of $^{12}B$ Nuclei Implantd in Hexagonal Single Crystals, F. D. CORRELL, R. C. HASKELL and L. MADANSKY, The Johns Hopkins University--A series of experiments to study the stopping sites of $^{12}B$ nuclei implanted in single crystals of $Be$ and Mg will be discussed. Previous measurements of the quadrupole couplings of $^{12}B$ in these metals indicated that two different stopping sites existed, one of which produced a negligible quadrupole coupling.

Beta active $^{12}B$ nuclei are produced via the reaction $^3\alpha(d,p)^{12}B$ and the recoil nuclei are implanted in the Be or Mg. The angles between the recoil direction and the directions of various crystal axes are varied in a systematic way. Preliminary results indicate that the number of nuclei that arrive at sites producing negligible quadrupole couplings changes as the angles are varied, suggesting that some correlation of the slow boron nuclei into these sites occurs. These results and a discussion of the application of the method to the determination of stopping sites will be presented.

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AF 9  The $^{16}O(P,\gamma)^{17}O$ Reaction. C. H. HOLBROW, Colgate University, J. GARRETT and B. F. PORTUM, University of Pennsylvania--Using 18-MeV $^3He$ ions from the University of Pennsylvania Tandem Van de Graaff accelerator the reaction $^{16}O(P,\gamma)^{17}O$ was induced in a target of gaseous nitrogen enriched to 98% in $^{16}O$. Alpha particle spectra were recorded in 3.75° intervals at 20 angles forward of 90° by means of a multichannel magnetic spectrometer. Angular distributions have been obtained for α-particle groups corresponding to excited states up to 10.43-MeV excitation in $^{16}O$. Spectroscopic factors extracted by analysis of the angular distributions with the distorted wave code DWUCK will be reported.

*Work supported by the National Science Foundation

AF 10  Study of the $^{16}O(\gamma,l_n)^{16}O$ Reaction, J. N. BISHOP, and H. F. HOFMANN, University of Pennsylvania--The $^{16}O(l_n)$ reaction was studied at 24 MeV bombarding energy, using a target of natural O2 gas contained in a gas cell with no entrance window. The outgoing neutrons were detected in a multi-angle spectrometer. The reaction is weak and quite non-selective. The largest differential cross section measured for a single state is 16 mb/ster. Angular distributions for center-of-mass angles less than 90° were obtained for the states up to 4 MeV in excitation. Their shapes are not oscillatory. The reaction appears to be dominated by a compound-nucleus mechanism.

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