results of using these analysis procedures to study variations in impurity behavior in ohmic- and beam-heated plasmas as the plasma density and beam power are varied.

II. TFTR Operating Conditions and Spectroscopic Diagnostics

During the two-neutral-beam period of TFTR operation (September 1984 - April 1985), significant plasma ion and electron heating was achieved by neutral beam injection with energies up to 80 keV and power levels up to 6 MW. During this period TFTR was operated with B_T and I_p up to 5.2 T and 2.5 MA, respectively. Detailed descriptions of this period of TFTR operation with an emphasis on confinement results are given elsewhere [5,6]; we briefly note some relevant parameters of the discharges studied here.

The plasmas discussed here had a major radius of 255-259 cm and a minor radius of 82 cm. A movable graphite blade limiter located on the large major radius side of the plasma at one toroidal location was the primary limiter; as a result, carbon was usually the dominant impurity species. The other important low-Z impurity in the plasma was oxygen desorbed from both the vacuum vessel walls and the limiter [7]. The quantity of oxygen present in a given discharge depended upon how recently chromium gettering had been performed [7], as well as the history of machine conditioning and plasma operation. The discharge-cleaning techniques used to condition the vacuum vessel, and its long-term clean-up due to plasma operation, have been described by LaMarche et al. [8]. The vacuum vessel is stainless steel, with Inconel cover plates located on the large major radius side of the torus near the midplane to protect the vacuum vessel bellows from accidental contact with the plasma. The small major radius wall of the vacuum vessel in the vicinity of the midplane was covered with Inconel slats which served as a preliminary inner bumper limiter. Although the plasmas discussed here were in direct contact only with the movable limiter, the close proximity of the plasma periphery to the Inconel inner bumper limiter and the Inconel bellows cover plates resulted in the major metallic impurities in the plasma being nickel and chromium, the primary constituents of Inconel. Smaller amounts of iron and titanium were also observed, the iron coming from the stainless steel vacuum vessel and from the Inconel components and the titanium remaining from a TiC coating previously deposited on the graphite limiter and removed before