Response to Comment on 'Pd growth and subsequent Schottky barrier formation on chemical vapor cleaned *p*-type GaN surfaces' [J. Appl. Phys. 91, 732 (2002)]

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Response to "Comment on 'Pd growth and subsequent Schottky barrier formation on chemical vapor cleaned *p*-type GaN surfaces' [J. Appl. Phys. 93, 3677 (2003)]"

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We appreciate the detailed clarification[1] of the UV-photoemission valence band spectra that we reported for the ammonia cleaned GaN surface.[2] In their comment, Bermudez *et al.*[1] clearly established that the GaN surface prepared with an ammonia clean exhibits a valence band edge that is not obscured by the substantial surface state band often detected after other cleaning techniques such as sputter anneal.[2-4] This would appear to be a significant advantage of the ammonia clean process over other surface preparation techniques.

An implication of their comment is that the electronic structure observed at the valence band edge is influenced by the presence of adsorbed ammonia, but the adsorbates do not apparently contribute occupied states in the GaN band gap. In our studies, we have found that the feature labeled with an asterisk (*) in the inset of Fig. 4 (Ref. 2) is quite sensitive to the surface preparation process, and these changes could indeed be indicative of adsorbed ammonia. Another possibility is that adsorbed hydrogen is responsible for the absence of the surface state band at the valence band edge.

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