CLAIMS

What is claimed is:

1. A method of forming a polycrystalline element, comprising:
forming a polycrystalline table on a first substrate;
removing catalyst material from at least a portion of the polycrystalline table;
removing the polycrystalline table and a portion of a first substrate attached to the polycrystalline table from a remainder of the first substrate; and
attaching the portion of the first substrate to another substrate.

2. The method of claim 1, further comprising:
disposing at least one of a catalyst material, a braze material, an inert reinfiltrant material, an organic adhesive, and an organo-metallic adhesive between the portion of the first substrate and the another substrate prior to attaching the portion of the first substrate to the another substrate.

3. The method of claim 1, further comprising:
minimizing a thickness of the portion of the first substrate attached to the polycrystalline table.

4. The method of claim 1, further comprising:
removing catalyst material substantially completely from the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

5. The method of claim 4, further comprising:
removing catalyst material from at least part of the portion of the first substrate prior to attaching the portion of the first substrate to the another substrate.

6. The method of any one of claims 1 through 5, wherein attaching the portion of the first substrate to another substrate comprises brazing the portion of the first substrate to the another substrate.

7. The method of any one of claims 1 through 5, wherein attaching the portion of the first substrate to another substrate comprises:

disposing the portion of the first substrate attached to the polycrystalline table on the another substrate; and

subjecting the polycrystalline table, the portion of the first substrate, and the another substrate to a high temperature/high pressure (HTHP) process.

8. The method of any one of claims 1 through 5, further comprising:

grinding a surface of the portion of the first substrate opposing the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

9. The method of any one of claims 1 through 5, further comprising:

forming a recess to extend at least partially through the portion of the first substrate from an end thereof opposite the polycrystalline table; and

inserting a protrusion of the another substrate into the recess prior to attaching the portion of the first substrate to the another substrate.

10. A method of forming a polycrystalline element, comprising:

subjecting a plurality of particles comprising superabrasive material disposed on an end of a mass of hard material to a high temperature/high pressure (HTHP) process in the presence of a catalyst material to form a polycrystalline table attached to a first substrate;

removing the catalyst material from at least a portion of the polycrystalline table;

removing the polycrystalline table and a portion of the first substrate attached to the polycrystalline table from a remainder of the first substrate; and

attaching the portion of the first substrate to another substrate, the portion of the first substrate being interposed between the polycrystalline table and the another substrate.

11. The method of claim 10, wherein attaching the portion of the first substrate to another substrate comprises brazing the portion of the first substrate to the another substrate.

12. The method of claim 10, wherein attaching the portion of the first substrate to another substrate comprises:

disposing the portion of the first substrate attached to the polycrystalline table on the another substrate, the portion of the first substrate being interposed between the polycrystalline table and the another substrate; and

subjecting the polycrystalline table, the portion of the first substrate, and the another substrate to another high temperature/high pressure (HTHP) process.

13. The method of claim 10, further comprising:

substantially removing the catalyst material from all of the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

14. The method of claim 13, further comprising:

removing catalyst material from at least part of the portion of the first substrate prior to attaching the portion of the first substrate to the another substrate.

15. The method of any one of claims 10 through 14, further comprising:

disposing at least one of a catalyst material, a braze material, an inert reinfiltrant material, an organic adhesive, and an organo-metallic adhesive between the portion of the first substrate and the another substrate prior to attaching the portion of the first substrate to the another substrate.

16. The method of any one of claims 10 through 14, further comprising:

grinding a surface of the portion of the first substrate opposing the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

17. The method of any one of claims 10 through 14, further comprising:

forming a recess to extend at least partially through the portion of the first substrate; and

inserting a protrusion of the another substrate at least partially into the recess prior to attaching the portion of the first substrate to the another substrate.

18. A polycrystalline element, comprising:

a polycrystalline table attached to a portion of a first substrate on which the polycrystalline table was formed; and

another substrate attached to the portion of the first substrate.

19. The polycrystalline element of claim 18, wherein the portion of the first substrate comprises an annular member bounding a central recess attached at a periphery of the polycrystalline table and the another substrate comprises a protrusion located in the central recess of the portion of the first substrate.

20. The polycrystalline element of claim 18 or claim 19, wherein at least one of an end of the portion of the first substrate and a facing end of the another substrate comprises a rough ground surface.

CLAIMS

What is claimed is:

1. A method of forming a polycrystalline element, comprising:

forming a polycrystalline table on a first substrate;

removing catalyst material from at least a portion of the polycrystalline table;

removing the polycrystalline table and a portion of the first substrate attached to the polycrystalline table from a remainder of the first substrate, rendering a thickness of the portion of the first substrate less than a thickness of the substrate before the polycrystalline table and the portion of the first substrate were removed; and

attaching the portion of the first substrate to another substrate, the portion of the first substrate being interposed between the polycrystalline table and the another substrate.

2. The method of claim 1, further comprising:

disposing at least one of a catalyst material, a braze material, an inert reinfiltrant material, an organic adhesive, and an organo-metallic adhesive between the portion of the first substrate and the another substrate prior to attaching the portion of the first substrate to the another substrate.

3. The method of claim 1, further comprising:

minimizing a thickness of the portion of the first substrate attached to the polycrystalline table.

4. The method of claim 1, wherein attaching the portion of the first substrate to another substrate comprises brazing the portion of the first substrate to the another substrate.

5. The method of claim 1, wherein attaching the portion of the first substrate to another substrate comprises:

disposing the portion of the first substrate attached to the polycrystalline table on the another substrate; and

subjecting the polycrystalline table, the portion of the first substrate, and the another substrate to a high temperature/high pressure (HTHP) process.

6. The method of claim 1, further comprising:

grinding a surface of the portion of the first substrate opposing the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

7. The method of claim 1, further comprising:

forming a recess to extend at least partially through the portion of the first substrate from an end thereof opposite the polycrystalline table; and

inserting a protrusion of the another substrate into the recess prior to attaching the portion of the first substrate to the another substrate.

8. The method of claim 1, further comprising:

removing catalyst material substantially completely from the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

9. The method of claim 8, further comprising:

removing catalyst material from at least part of the portion of the first substrate prior to attaching the portion of the first substrate to the another substrate.

10. A method of forming a polycrystalline element, comprising:

subjecting a plurality of particles comprising a superabrasive material disposed on an end of a mass of hard material to a high temperature/high pressure (HTHP) process in the presence of a catalyst material to form a polycrystalline table attached to a first substrate;

removing the catalyst material from at least a portion of the polycrystalline table;

removing the polycrystalline table and a portion of the first substrate attached to the polycrystalline table from a remainder of the first substrate, rendering a thickness of the portion of the first substrate less than a thickness of the substrate before the polycrystalline table and the portion of the first substrate were removed; and

attaching the portion of the first substrate to another substrate, the portion of the first substrate being interposed between the polycrystalline table and the another substrate.

11. The method of claim 10, further comprising:

disposing at least one of a catalyst material, a braze material, an inert reinfiltrant material, an organic adhesive, and an organo-metallic adhesive between the portion of the first substrate and the another substrate prior to attaching the portion of the first substrate to the another substrate.

12. The method of claim 10, wherein attaching the portion of the first substrate to another substrate comprises brazing the portion of the first substrate to the another substrate.

13. The method of claim 10, wherein attaching the portion of the first substrate to another substrate comprises:

disposing the portion of the first substrate attached to the polycrystalline table on the another substrate, the portion of the first substrate being interposed between the polycrystalline table and the another substrate; and

subjecting the polycrystalline table, the portion of the first substrate, and the another substrate to another high temperature/high pressure (HTHP) process.

14. The method of claim 10, further comprising:

grinding a surface of the portion of the first substrate opposing the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

15. The method of claim 10, further comprising:

forming a recess to extend at least partially through the portion of the first substrate; and

inserting a protrusion of the another substrate at least partially into the recess prior to attaching the portion of the first substrate to the another substrate.

16. The method of claim 10, further comprising:

substantially removing the catalyst material from all of the polycrystalline table prior to attaching the portion of the first substrate to the another substrate.

17. The method of claim 16, further comprising:

removing catalyst material from at least part of the portion of the first substrate prior to attaching the portion of the first substrate to the another substrate.