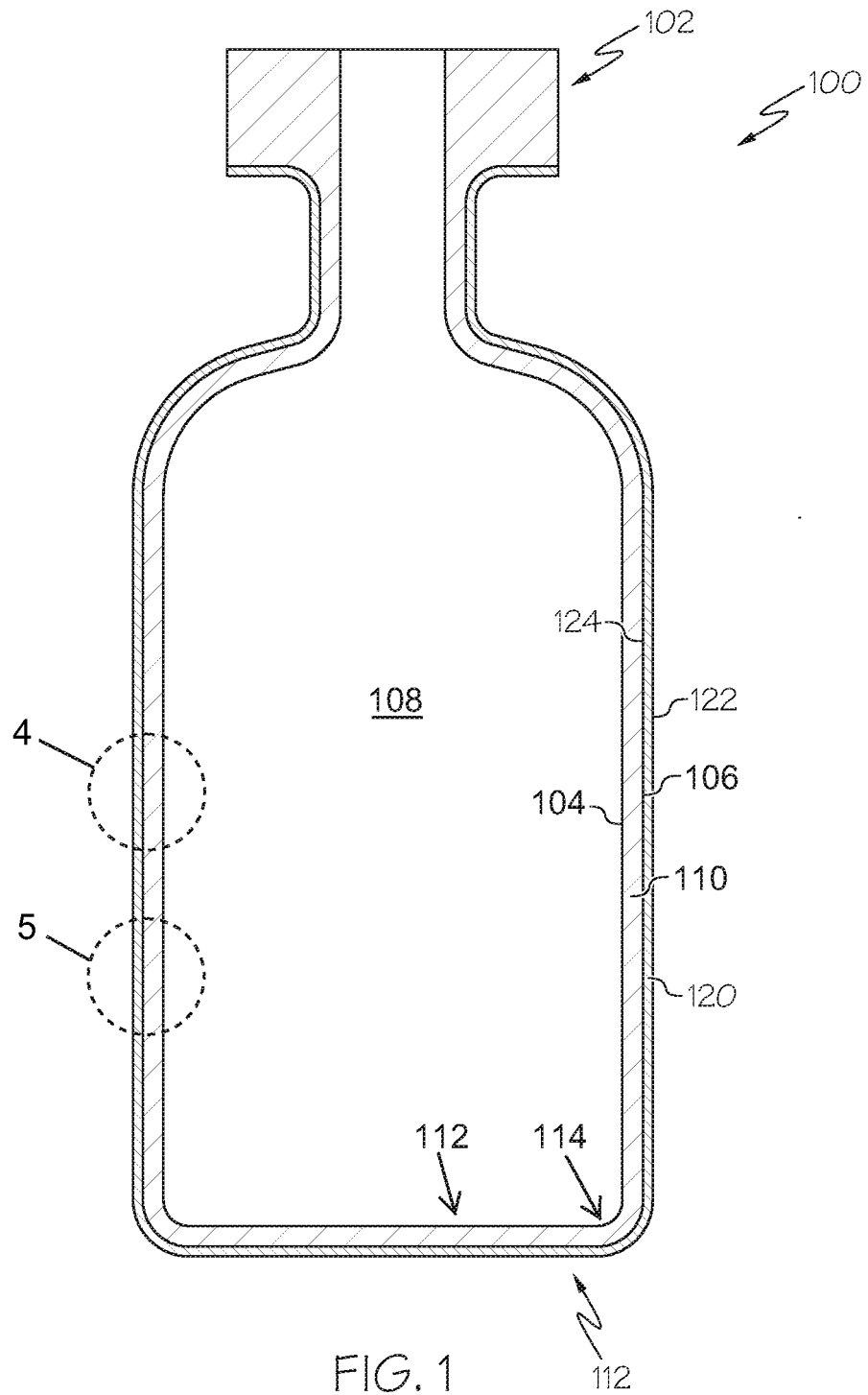
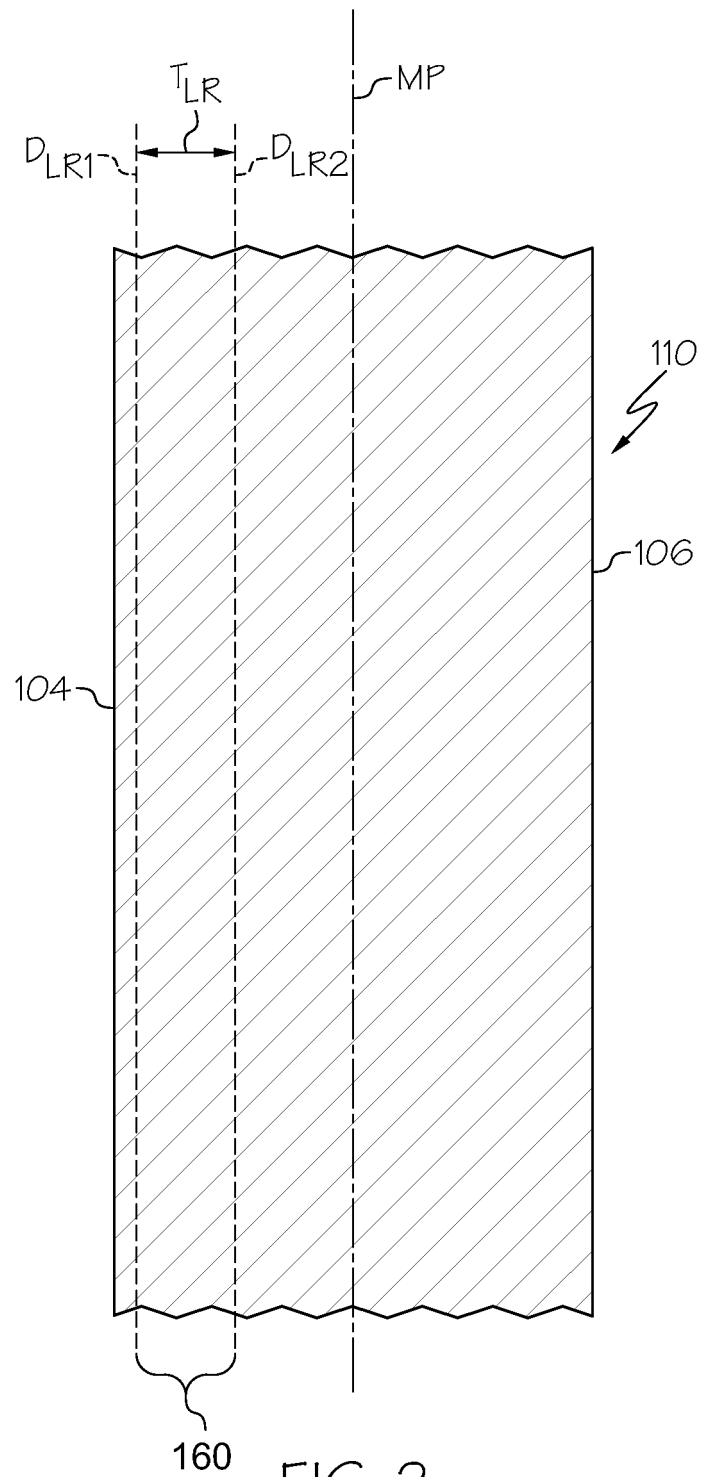




2 / 60



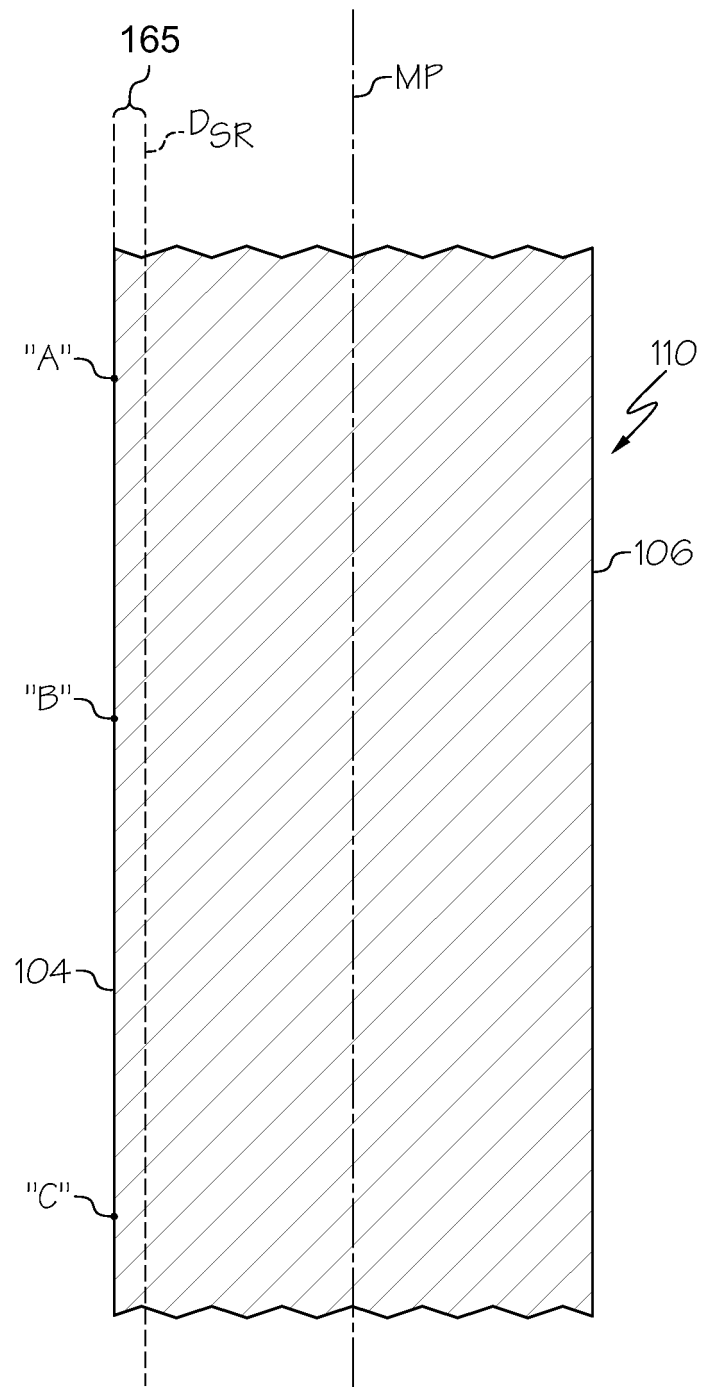


FIG. 3

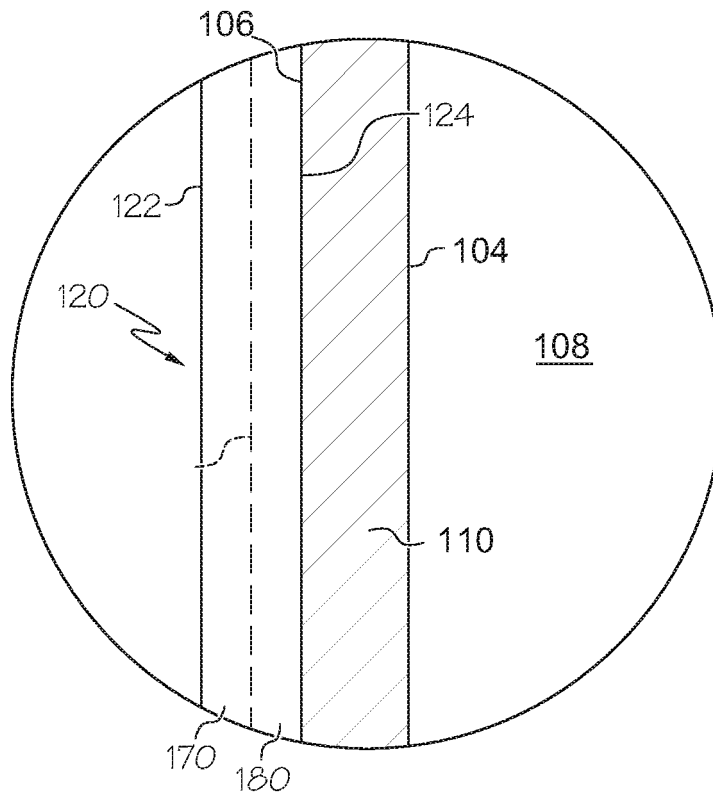


FIG. 4

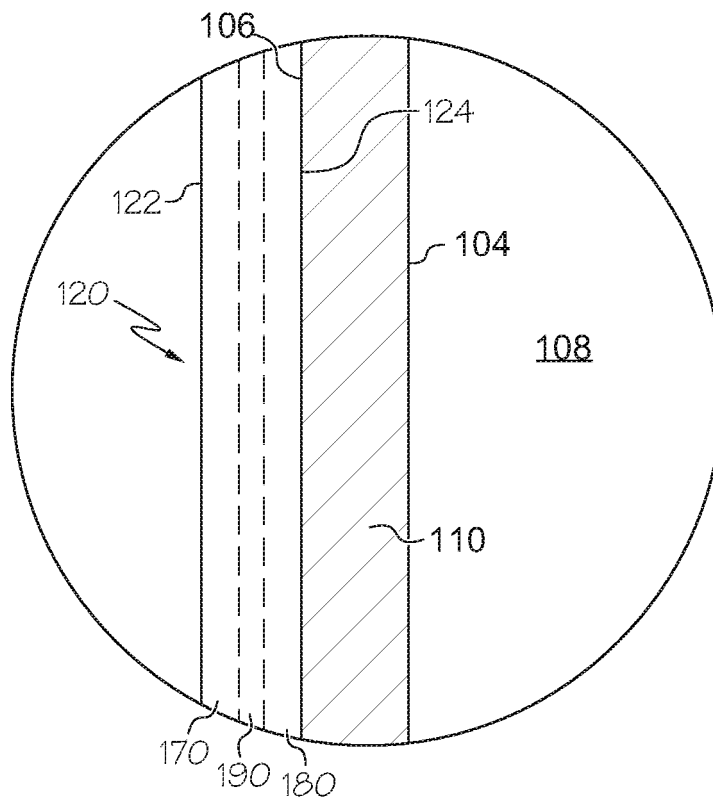


FIG. 5

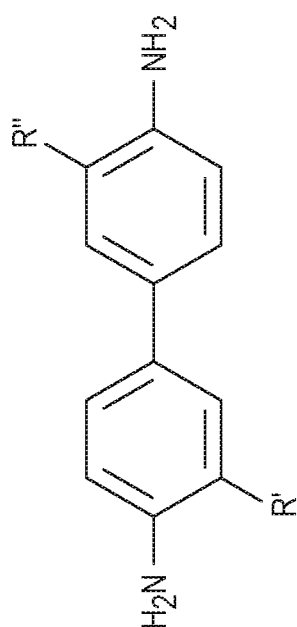


FIG. 6

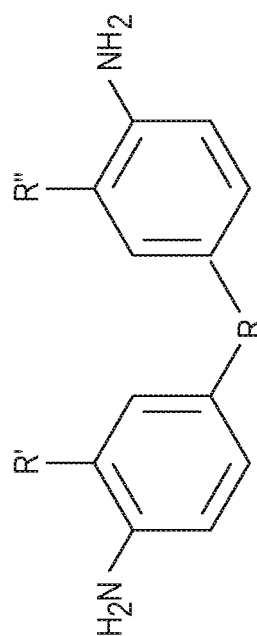
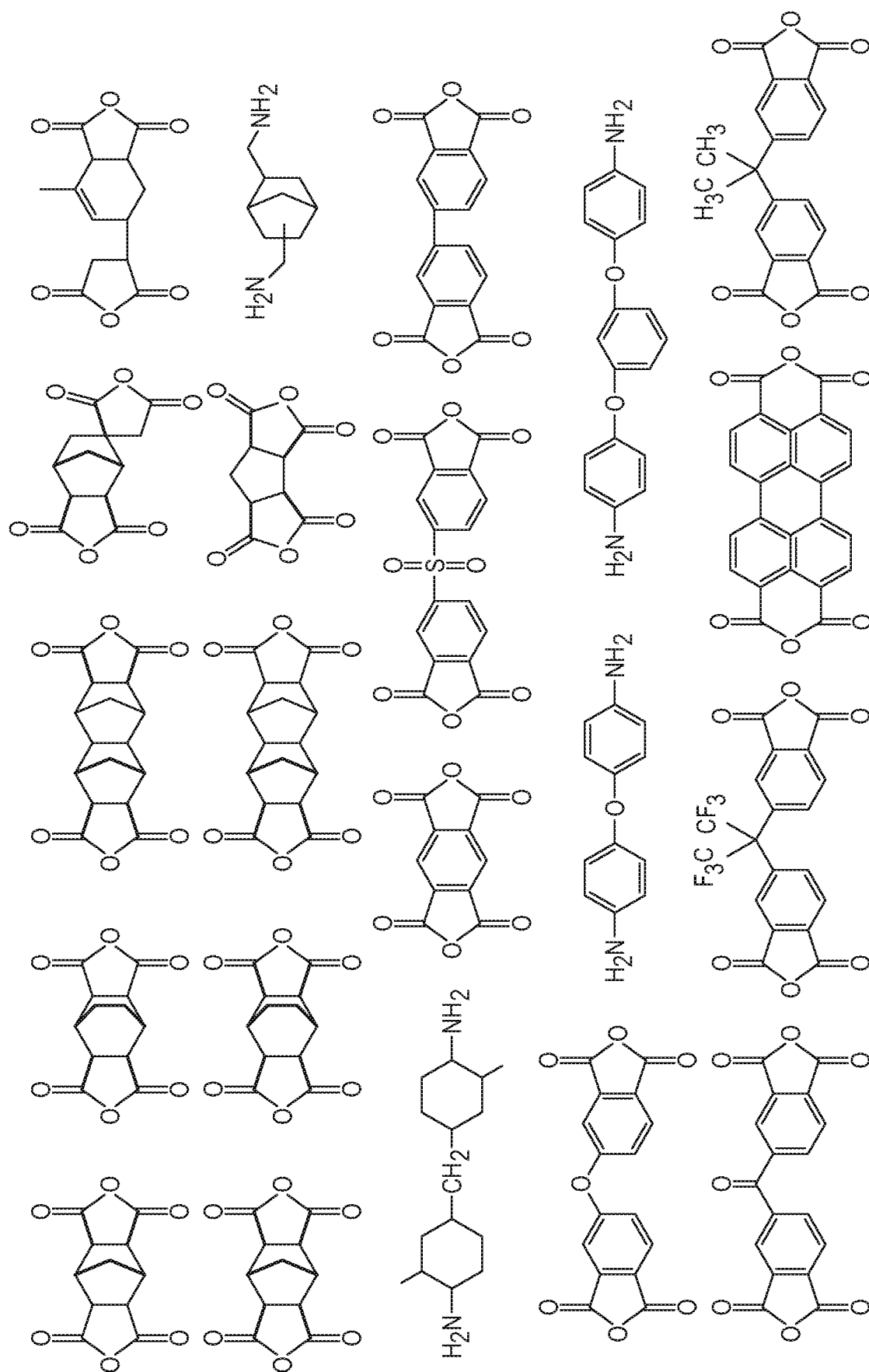


FIG. 7



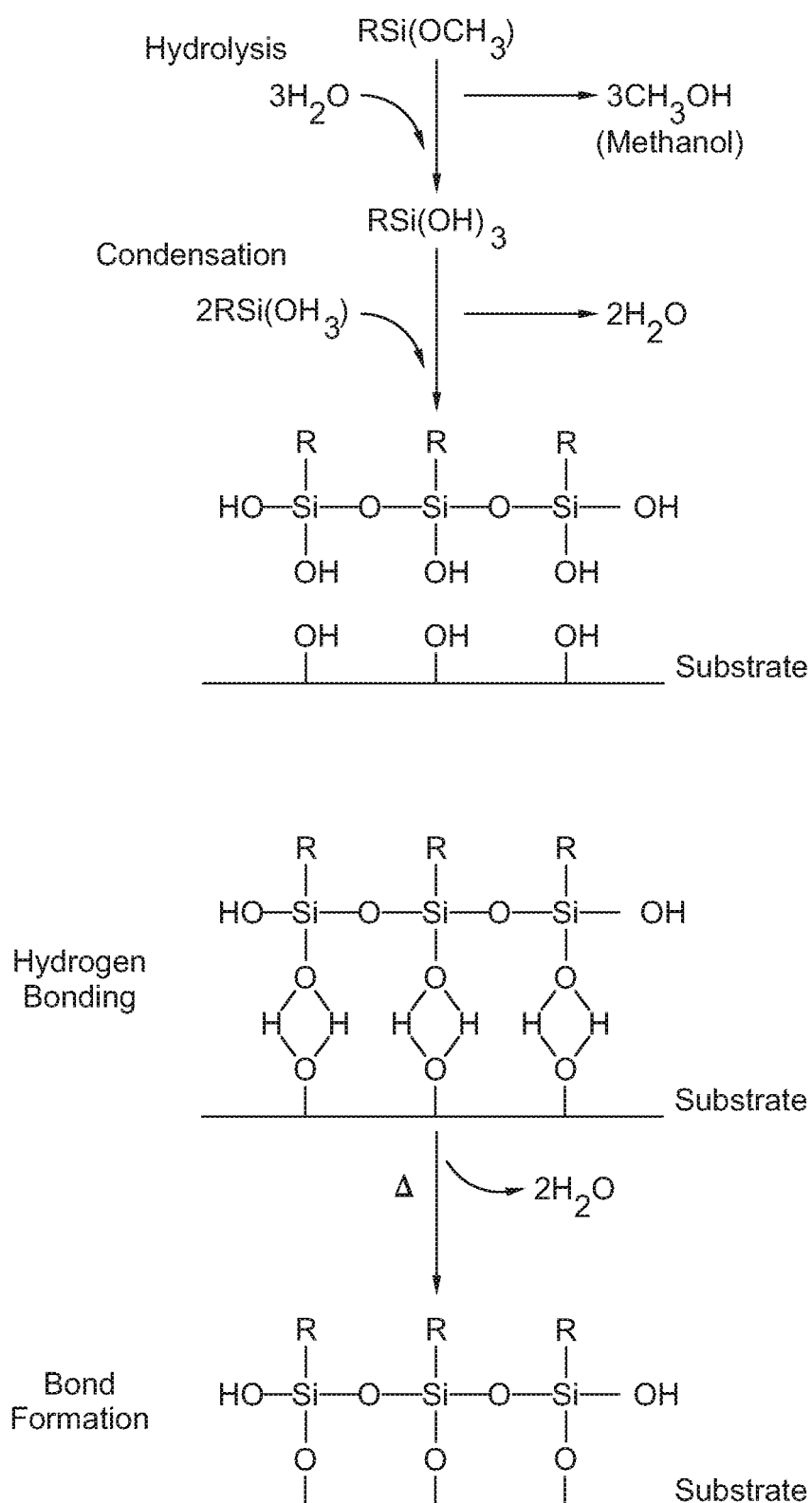


FIG. 9

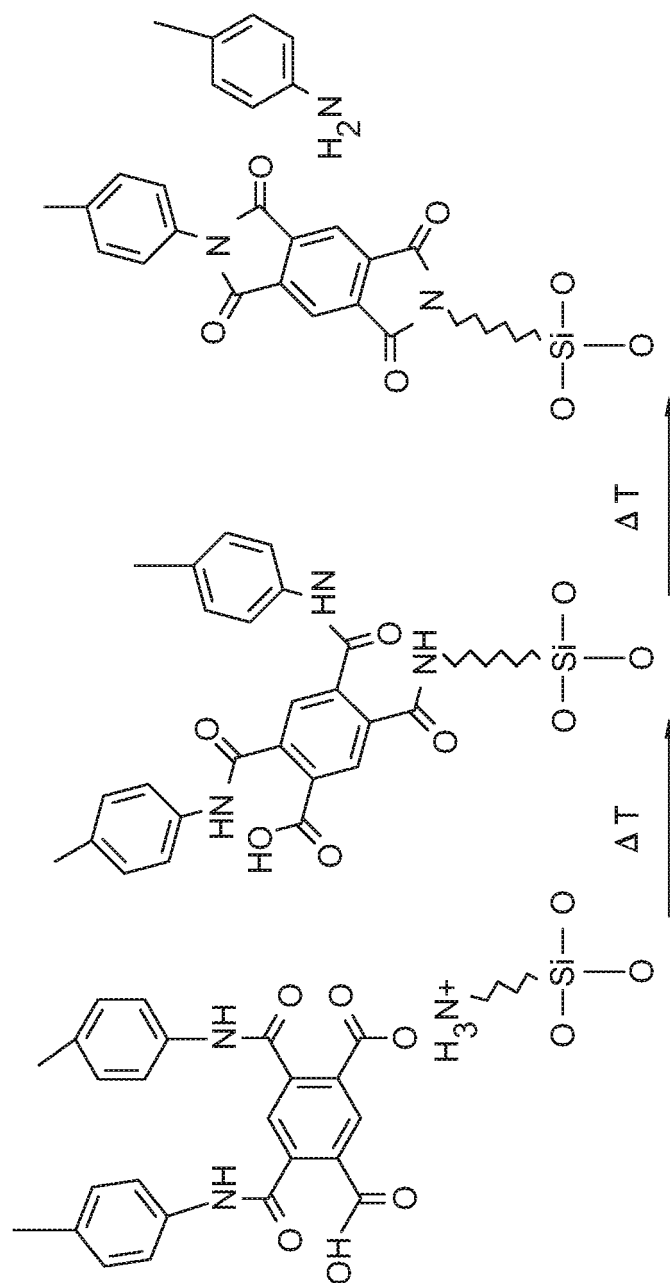


FIG. 10



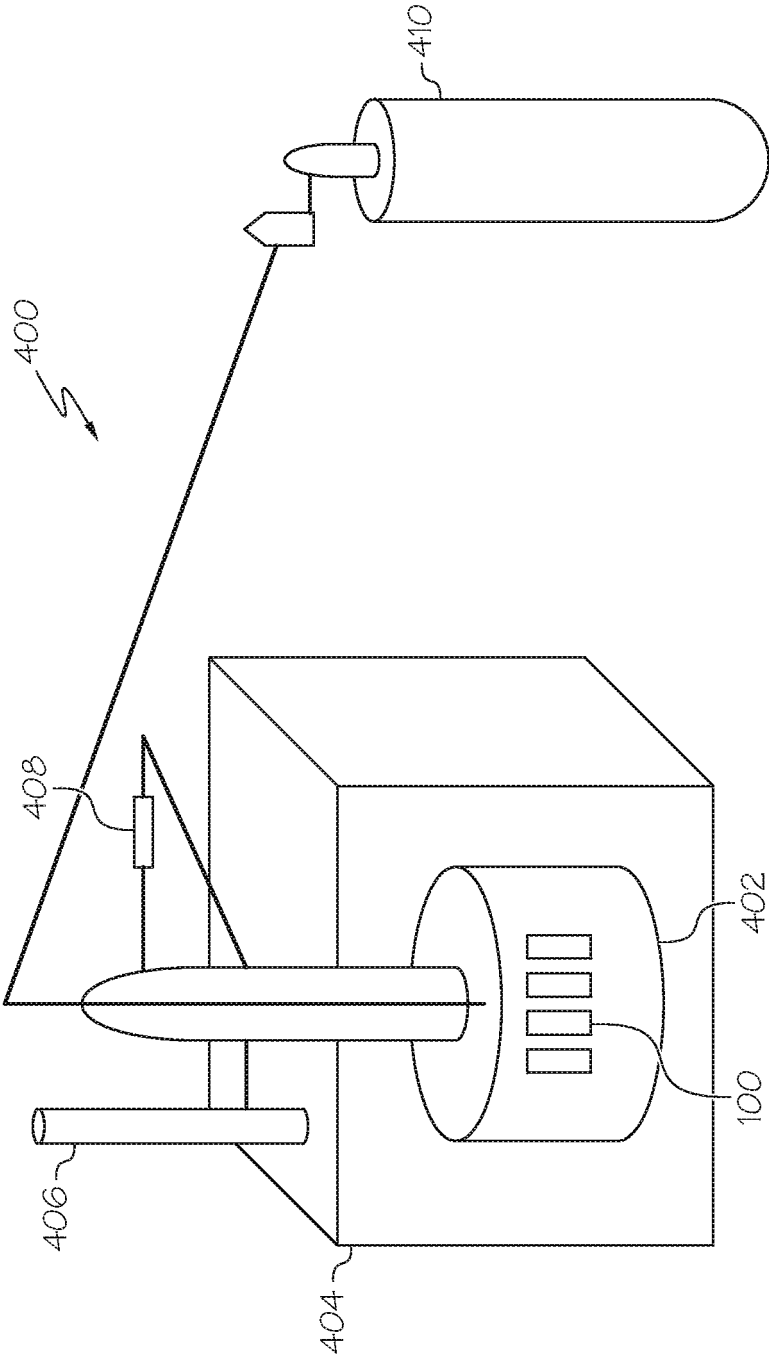


FIG. 12

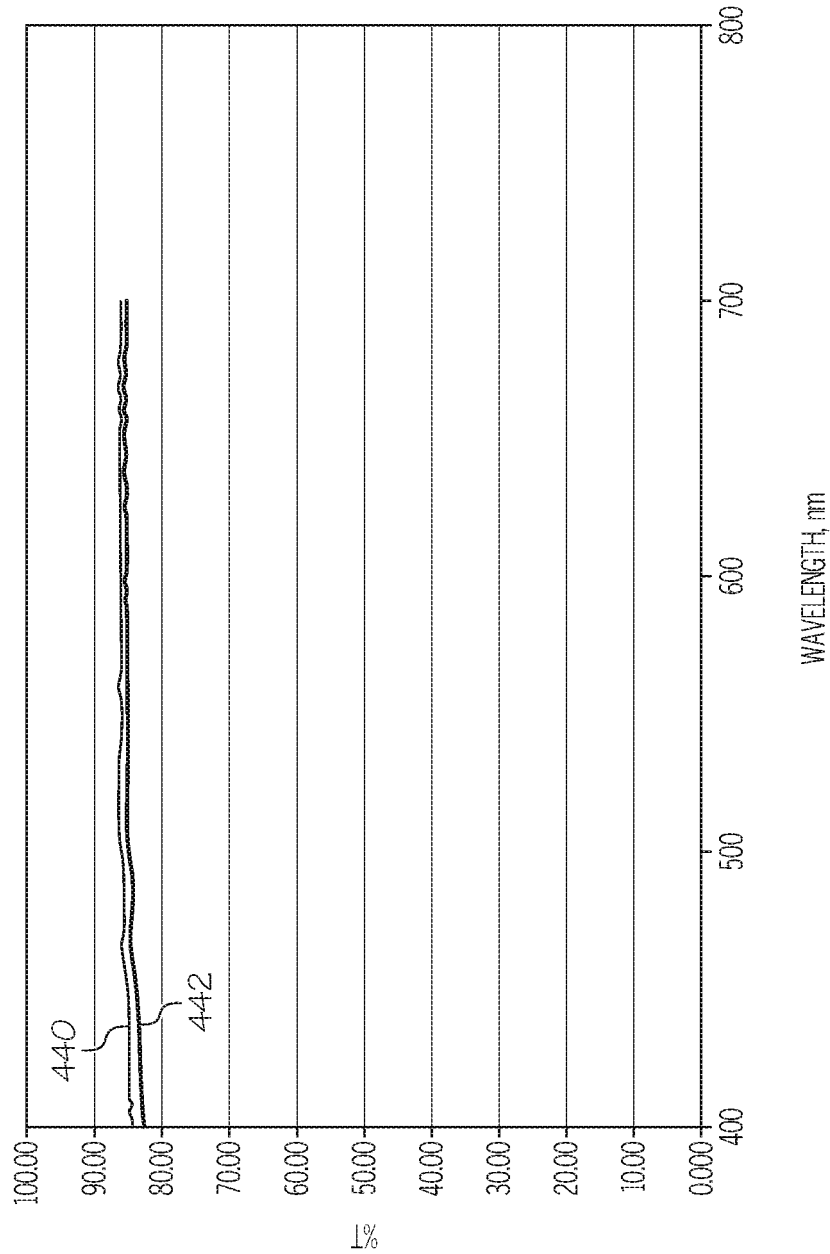


FIG. 13

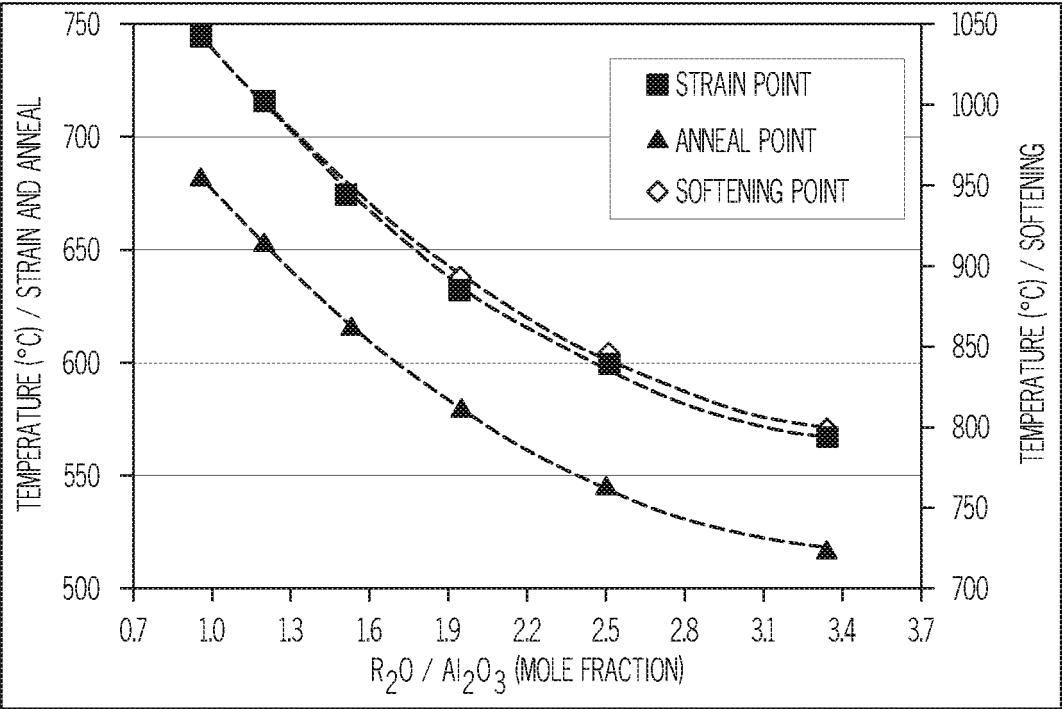


FIG. 14

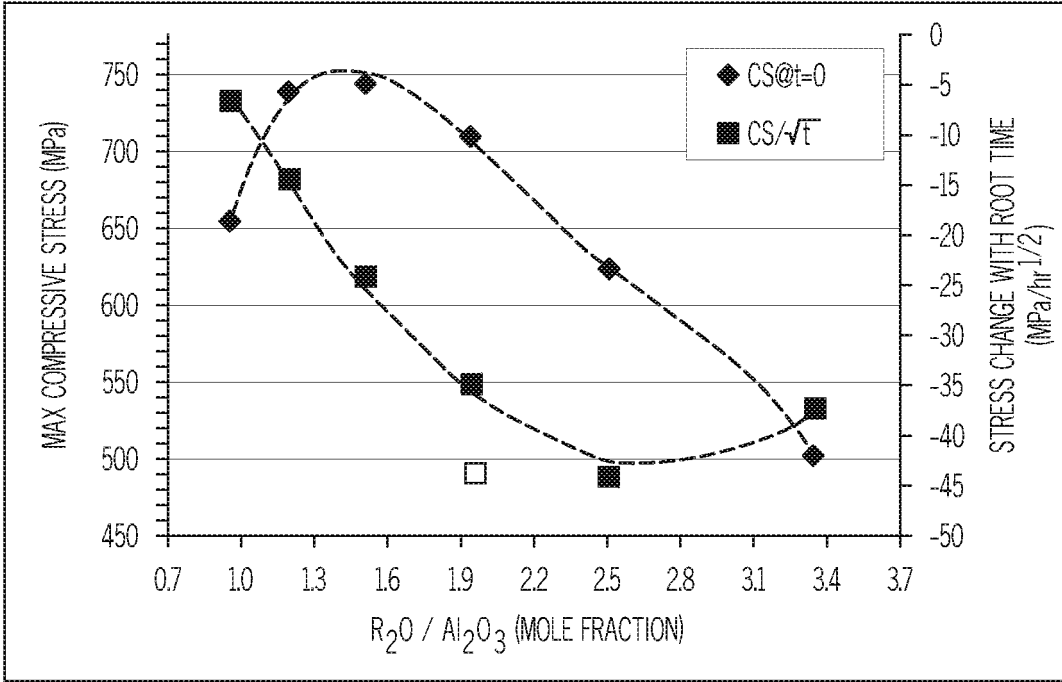


FIG. 15

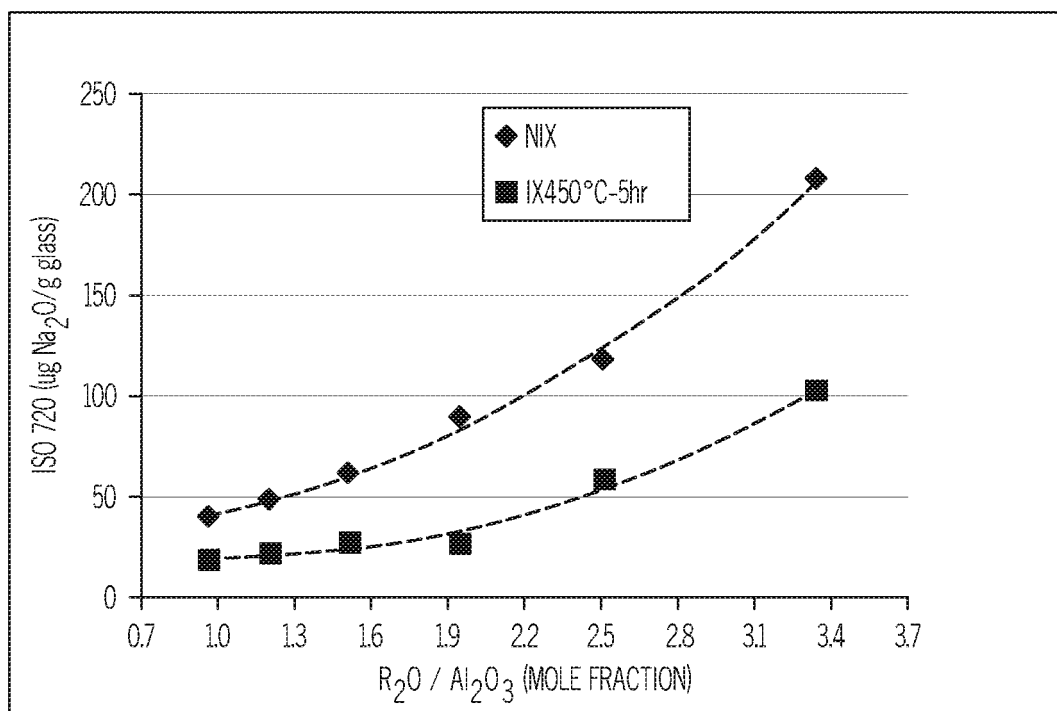


FIG. 16

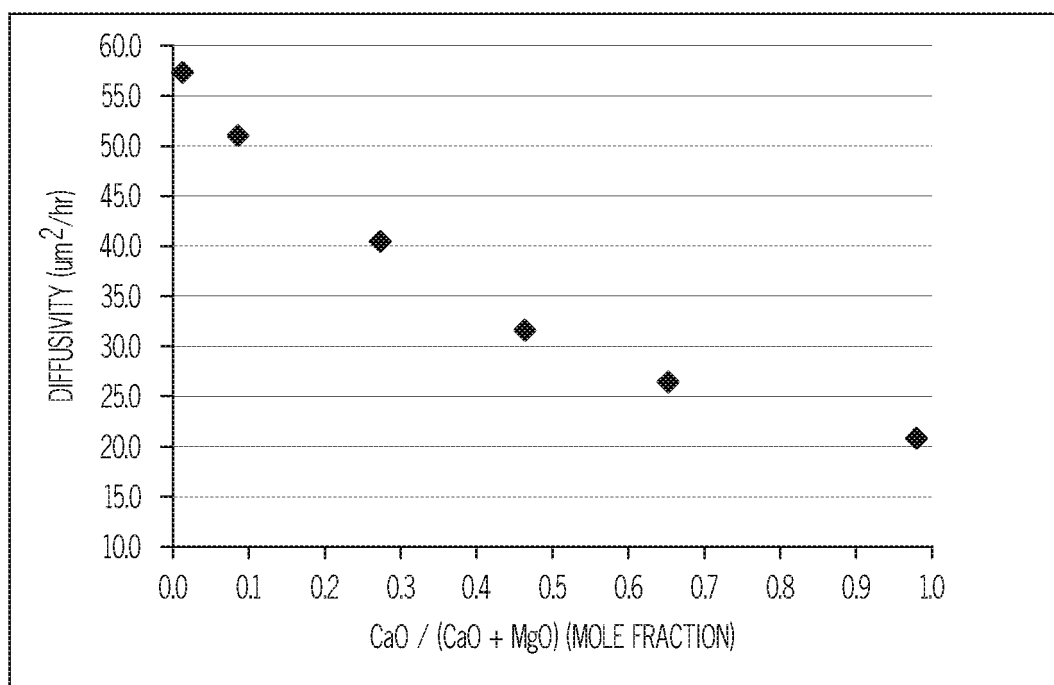


FIG. 17

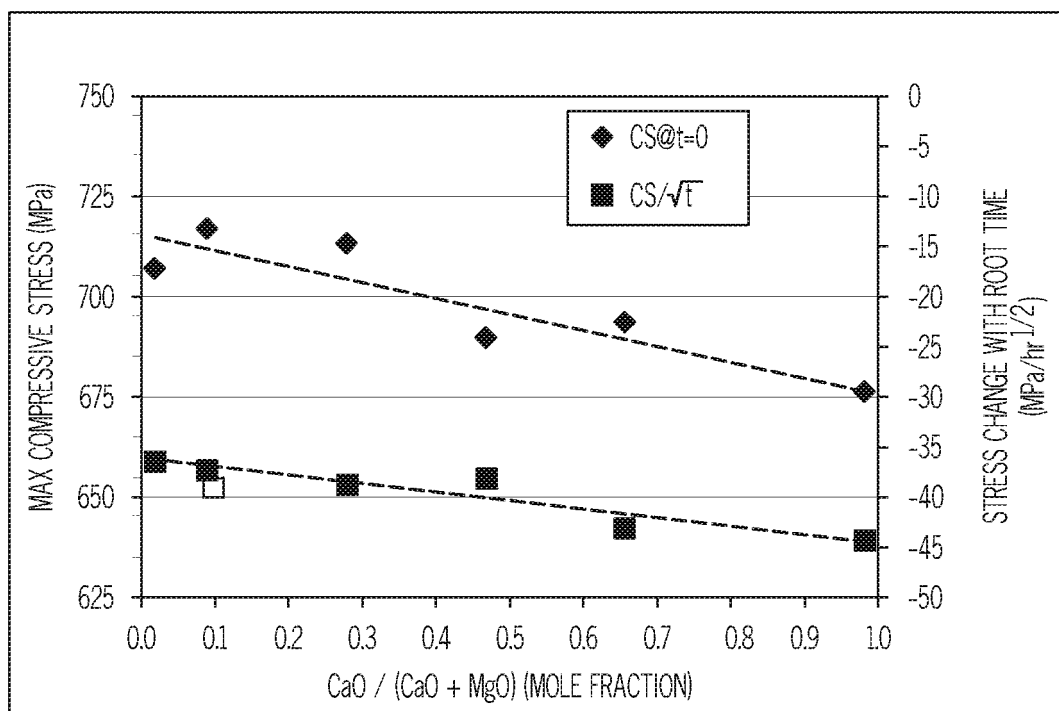


FIG. 18

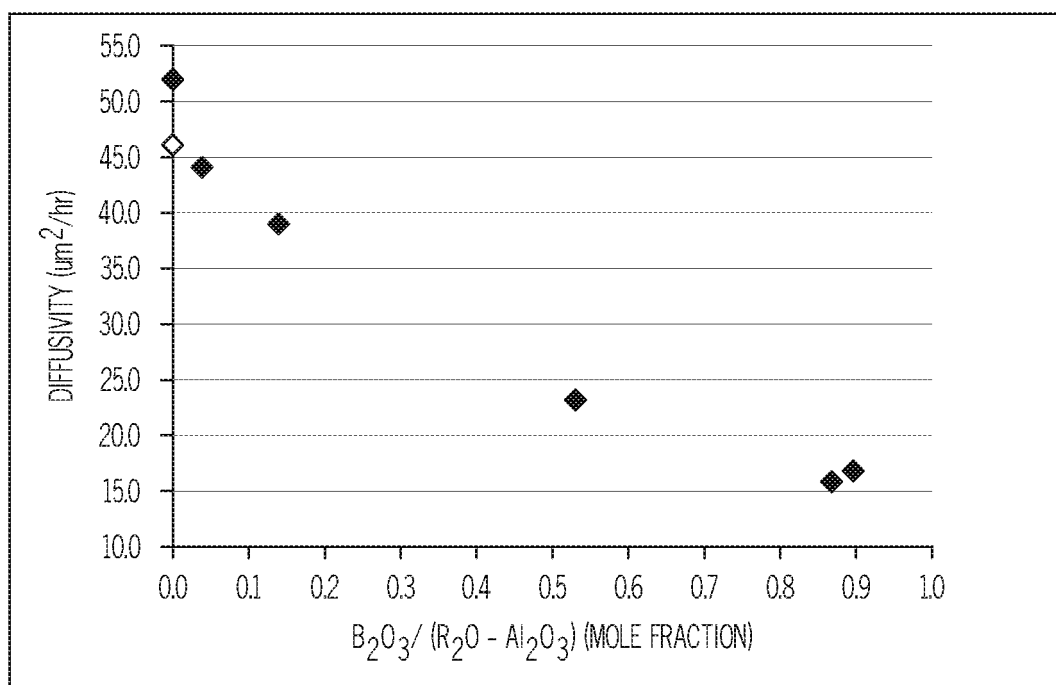


FIG. 19

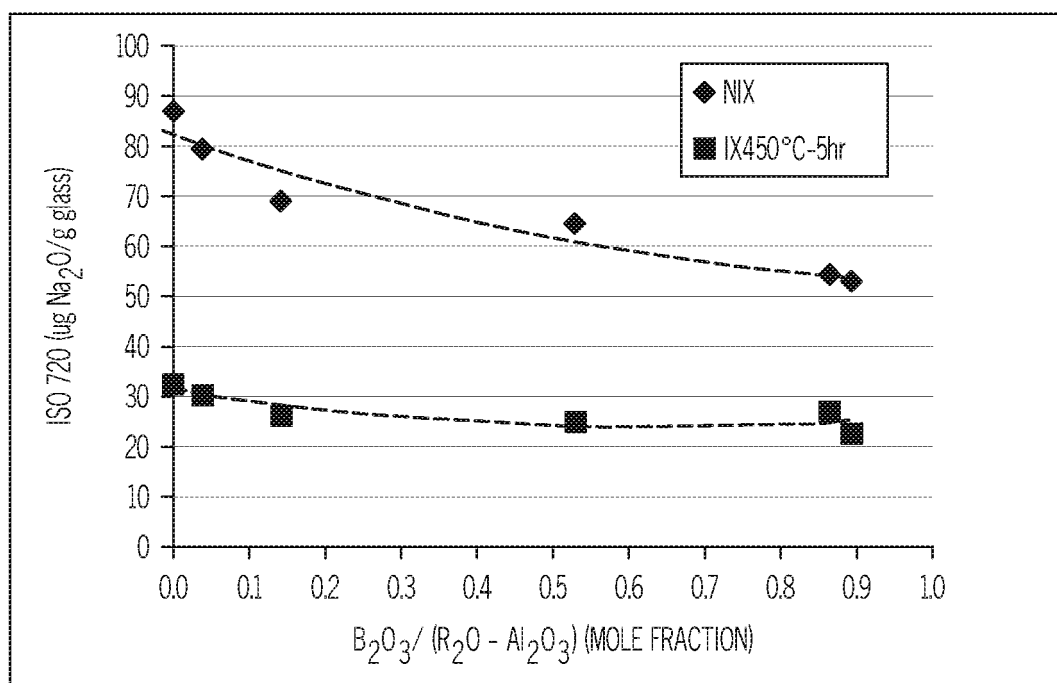


FIG. 20

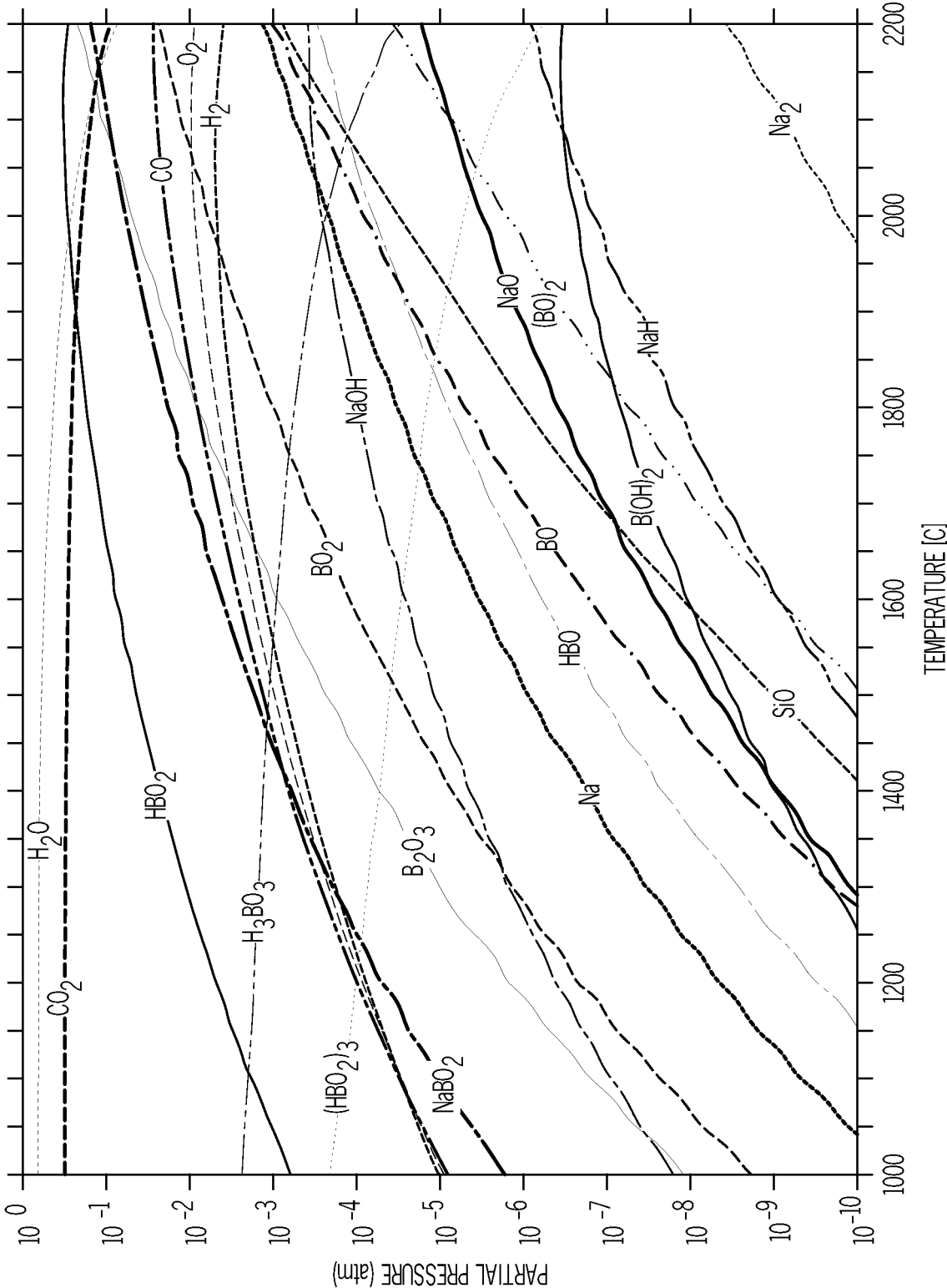


FIG. 21

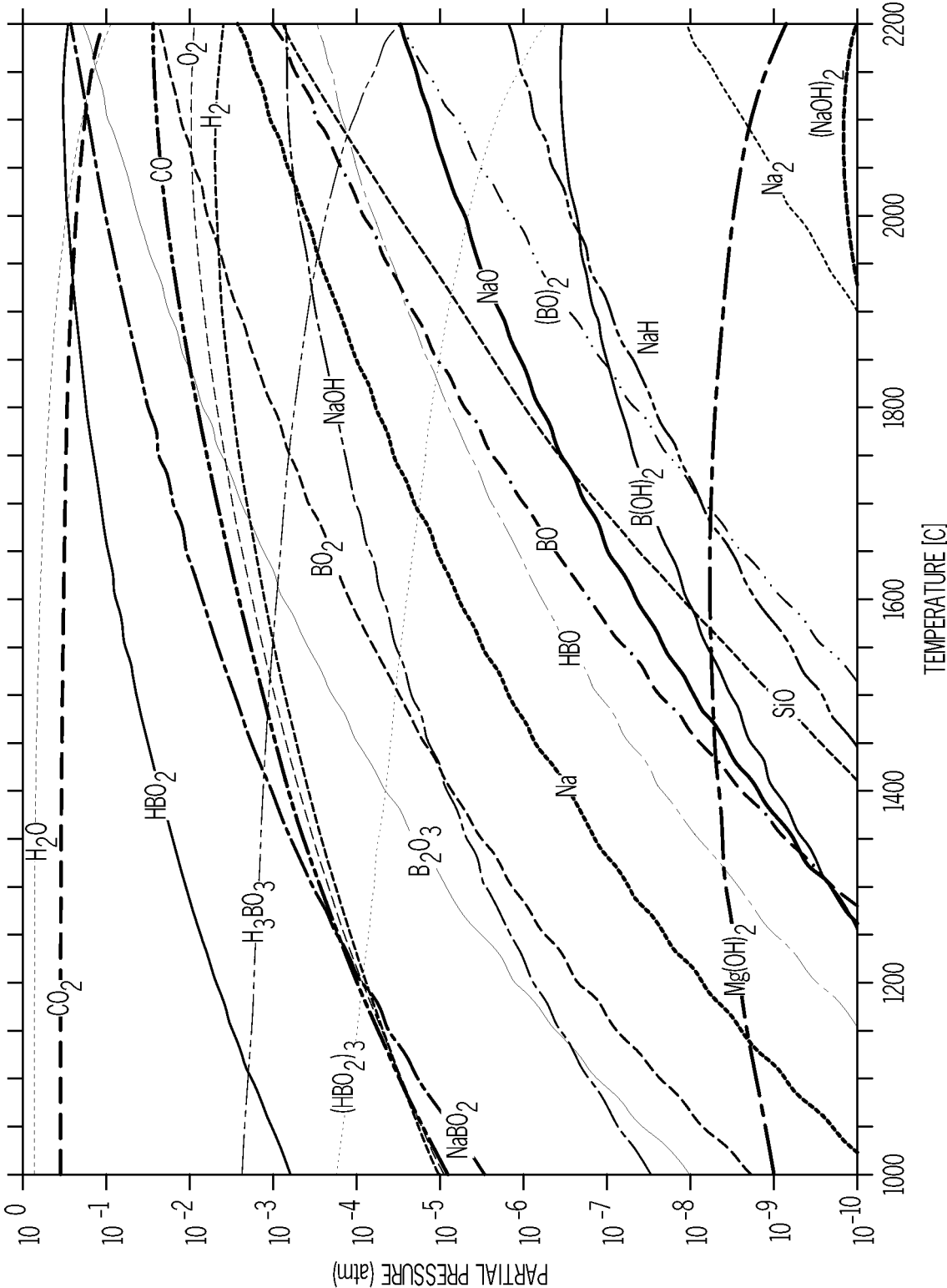


FIG. 22

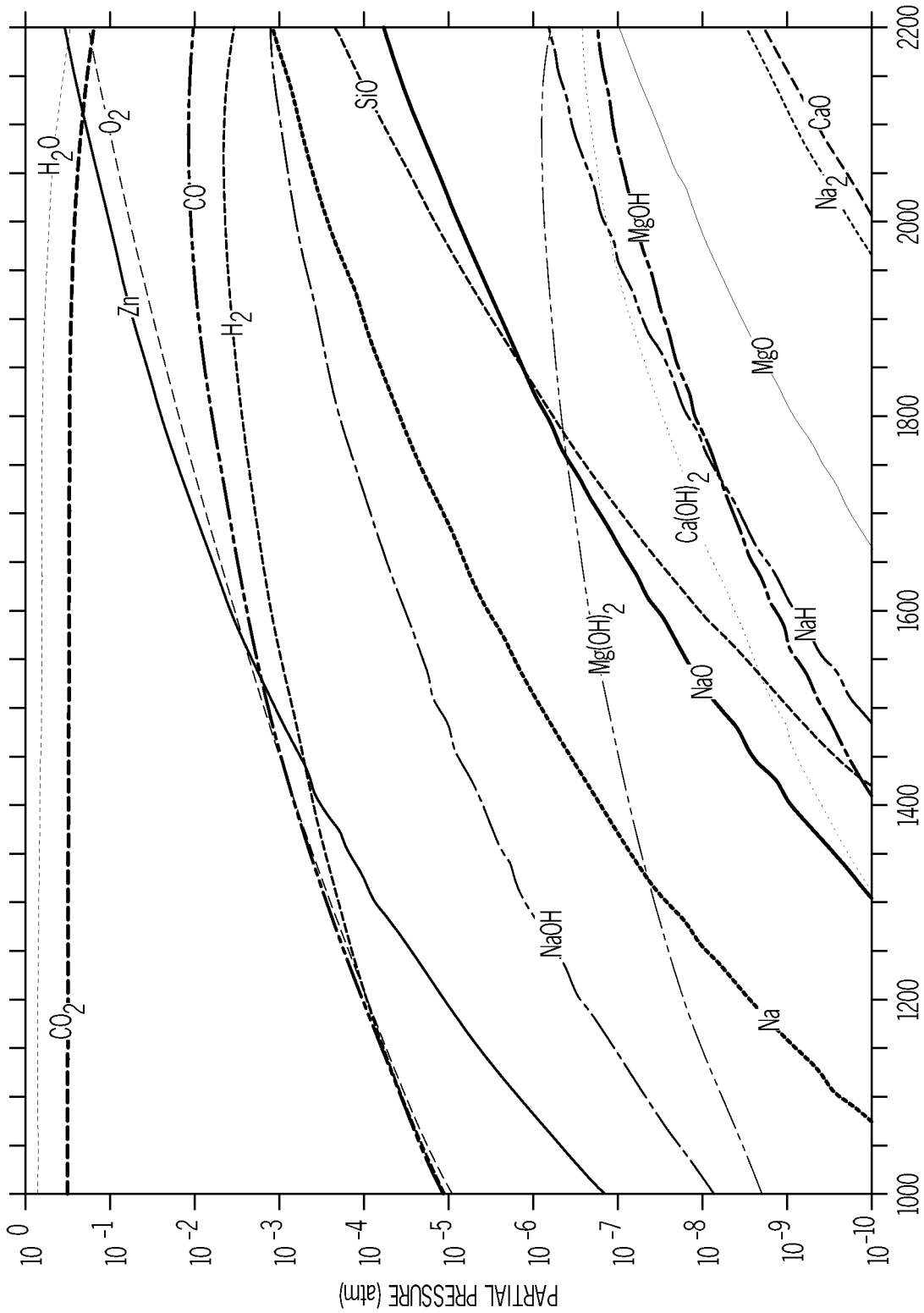


FIG. 23

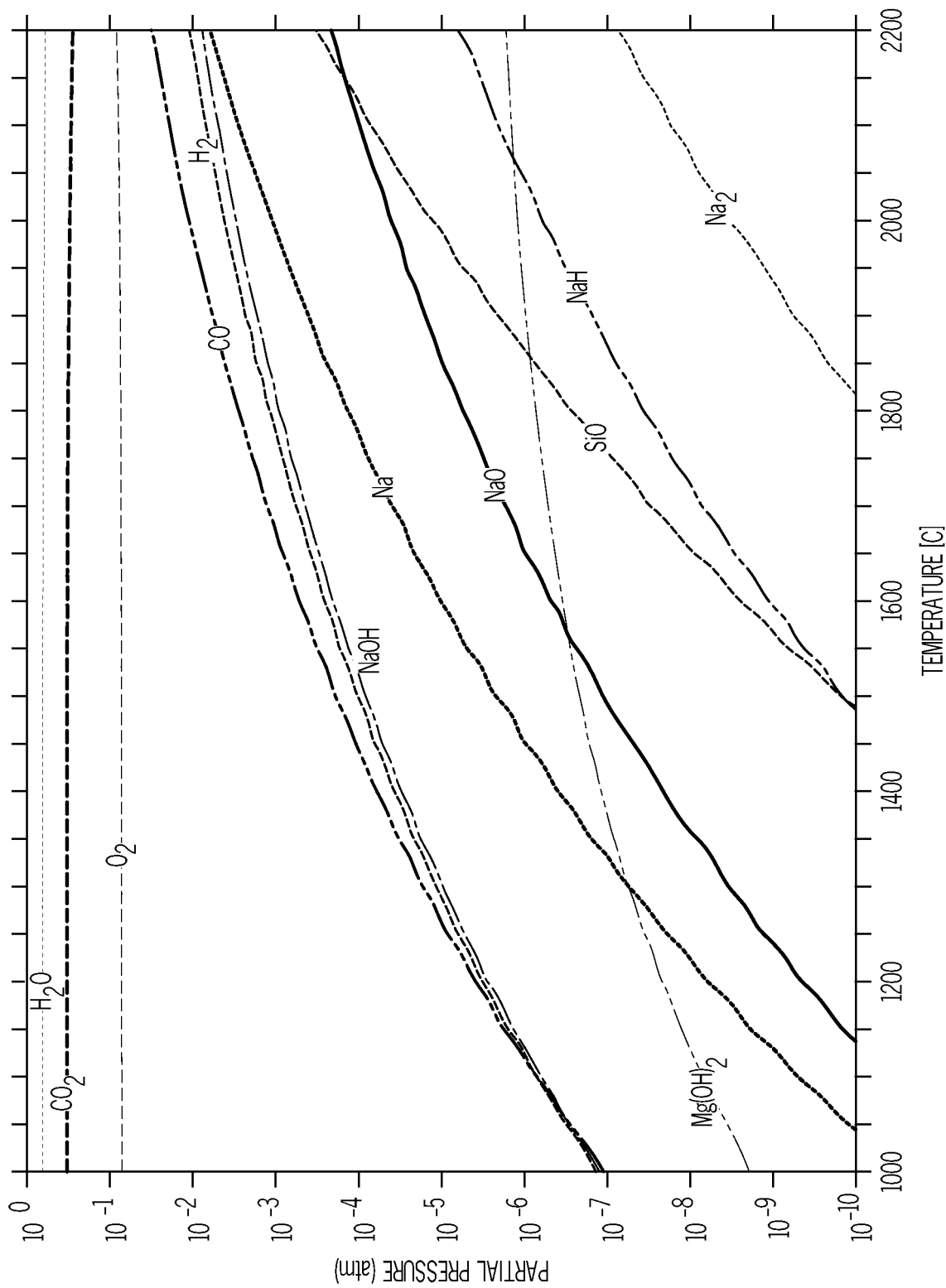


FIG. 24

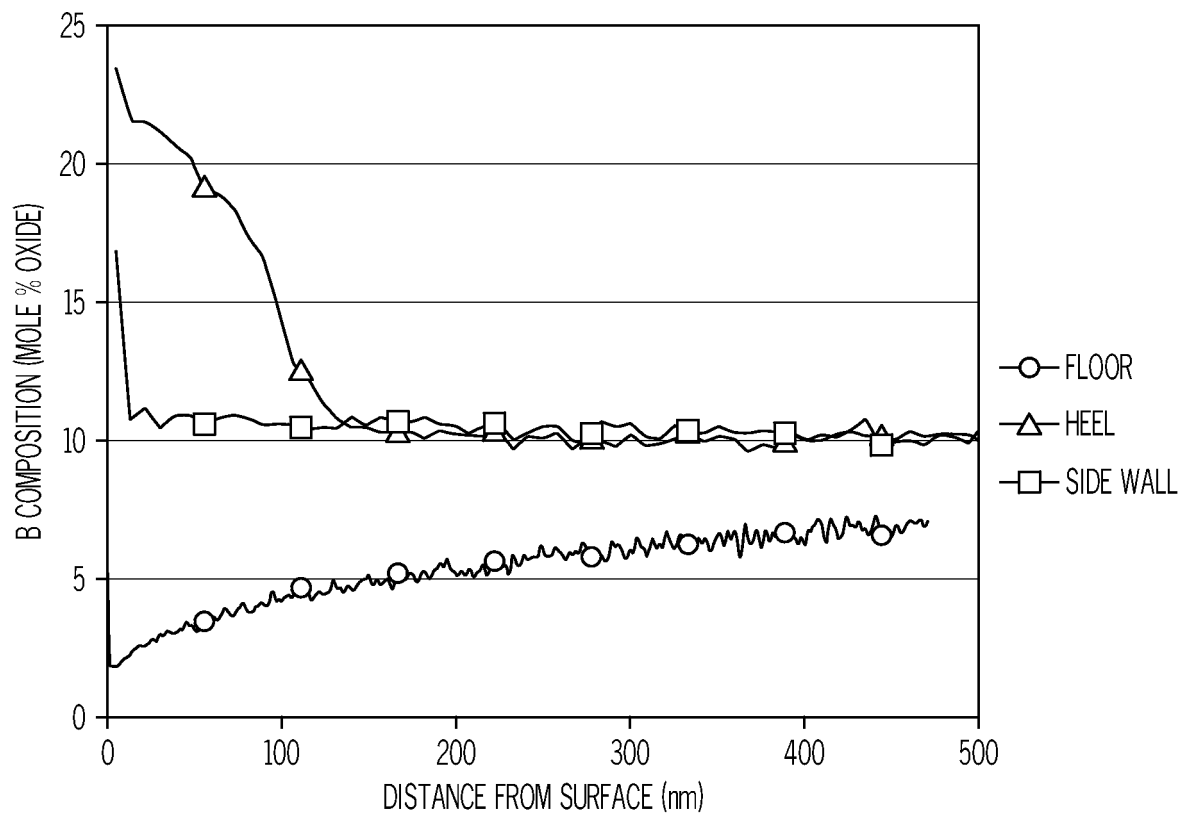


FIG. 25A

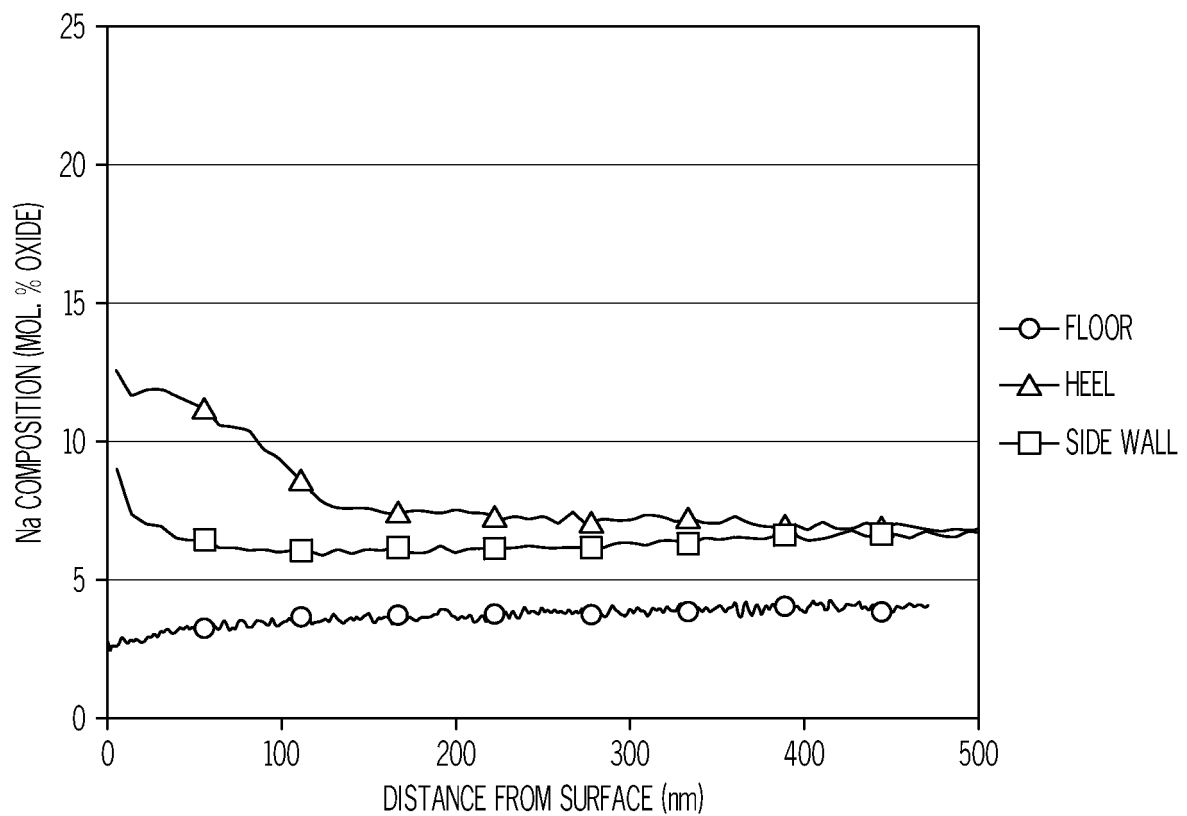


FIG. 25B

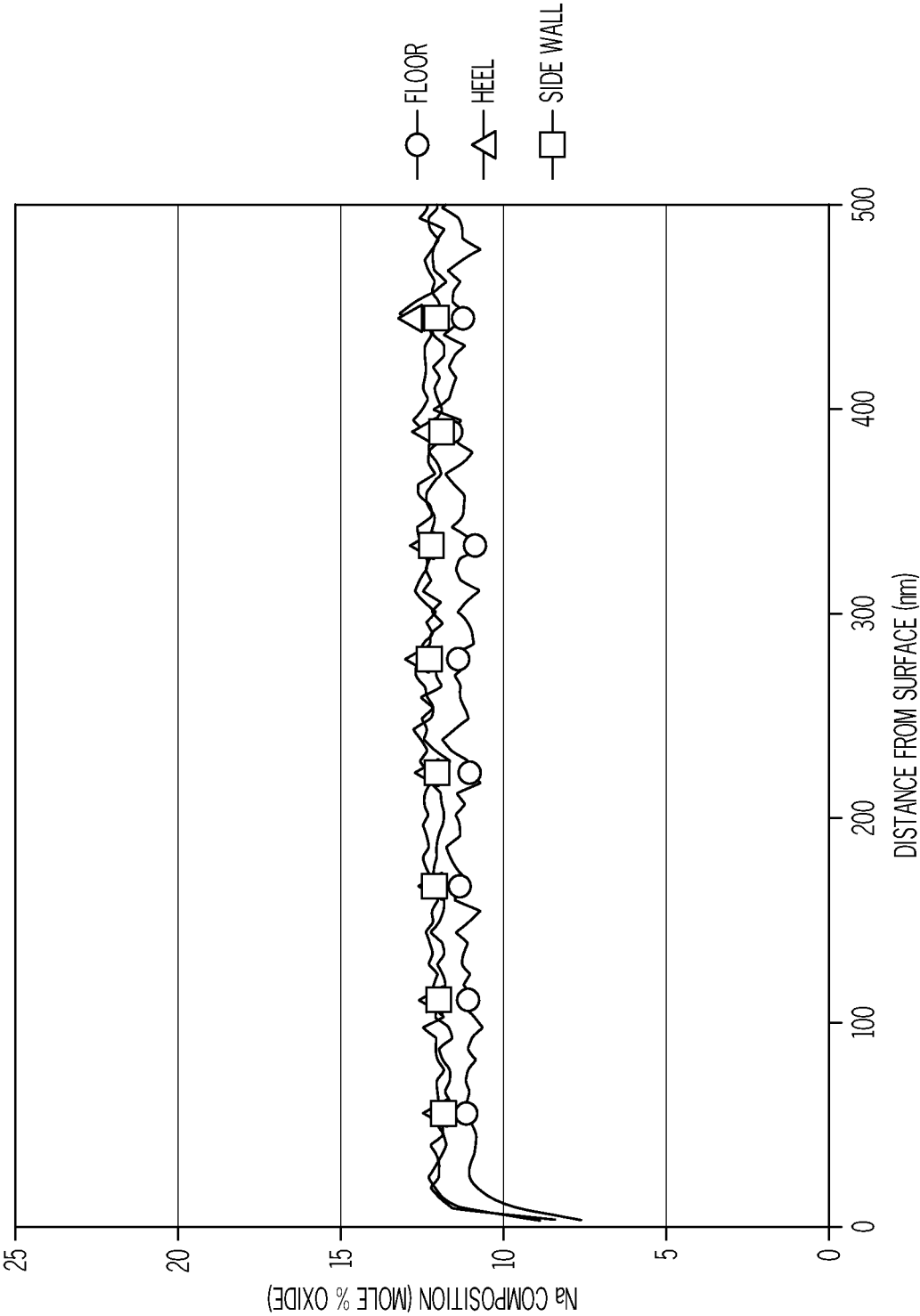


FIG. 26

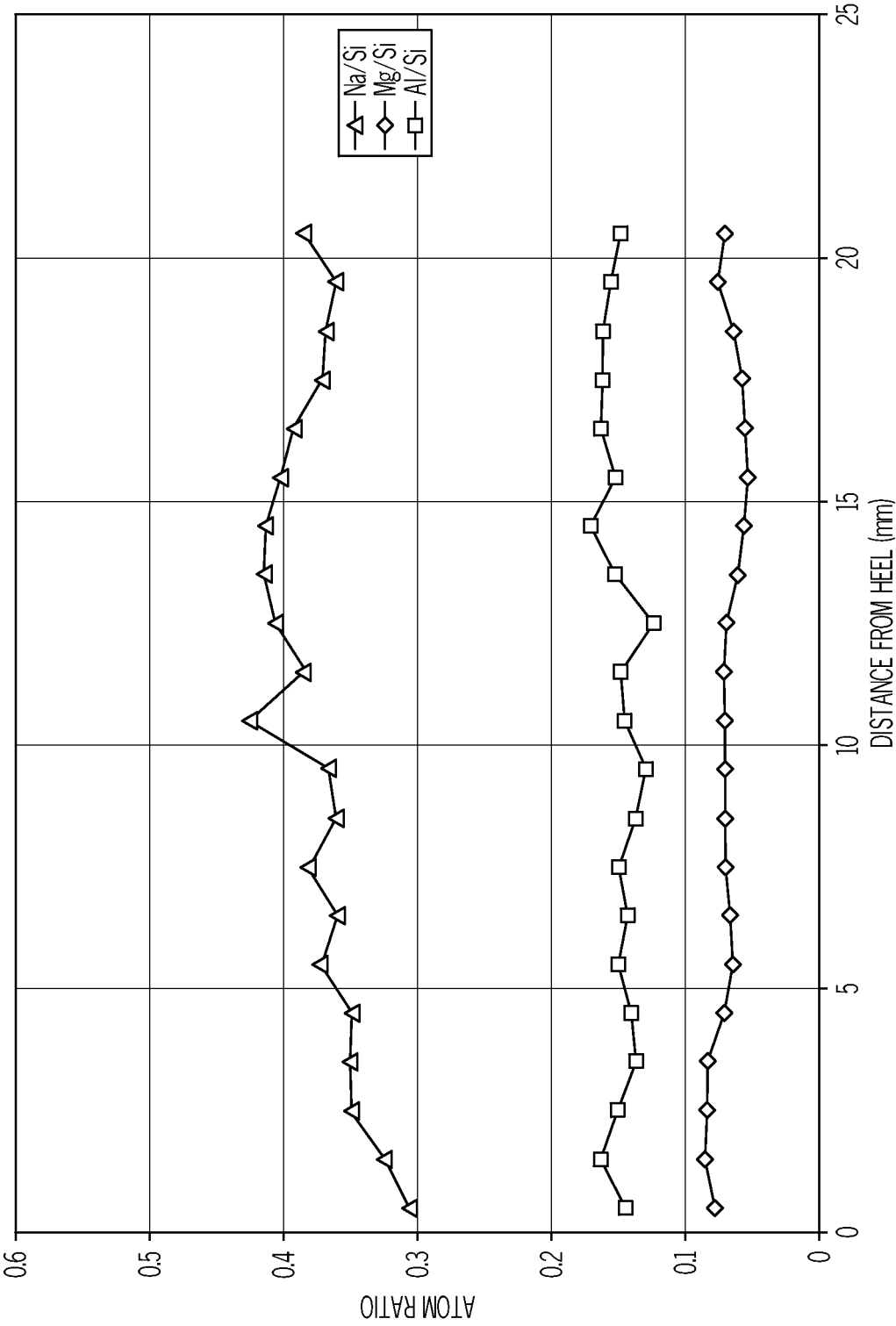


FIG. 27

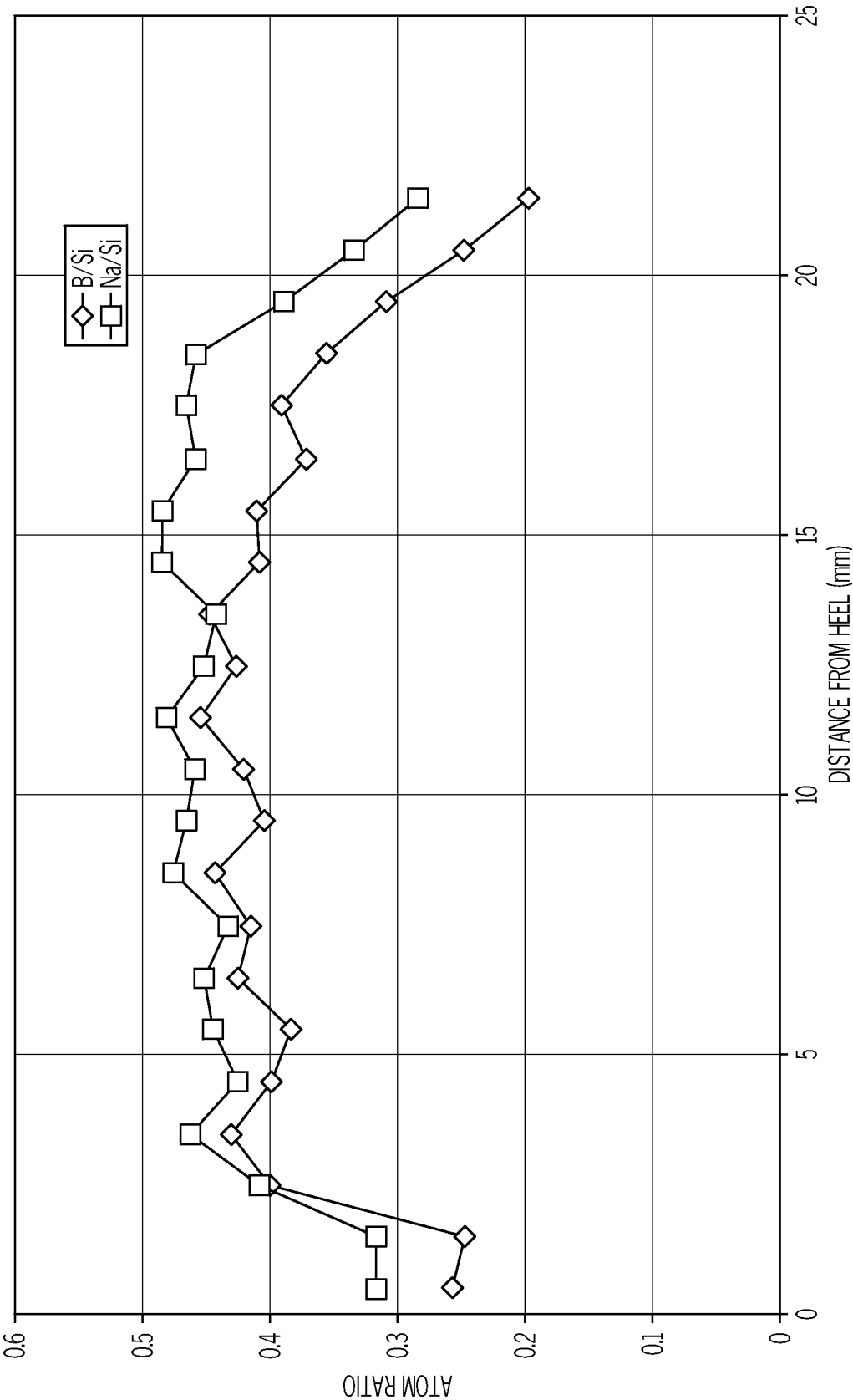


FIG. 28

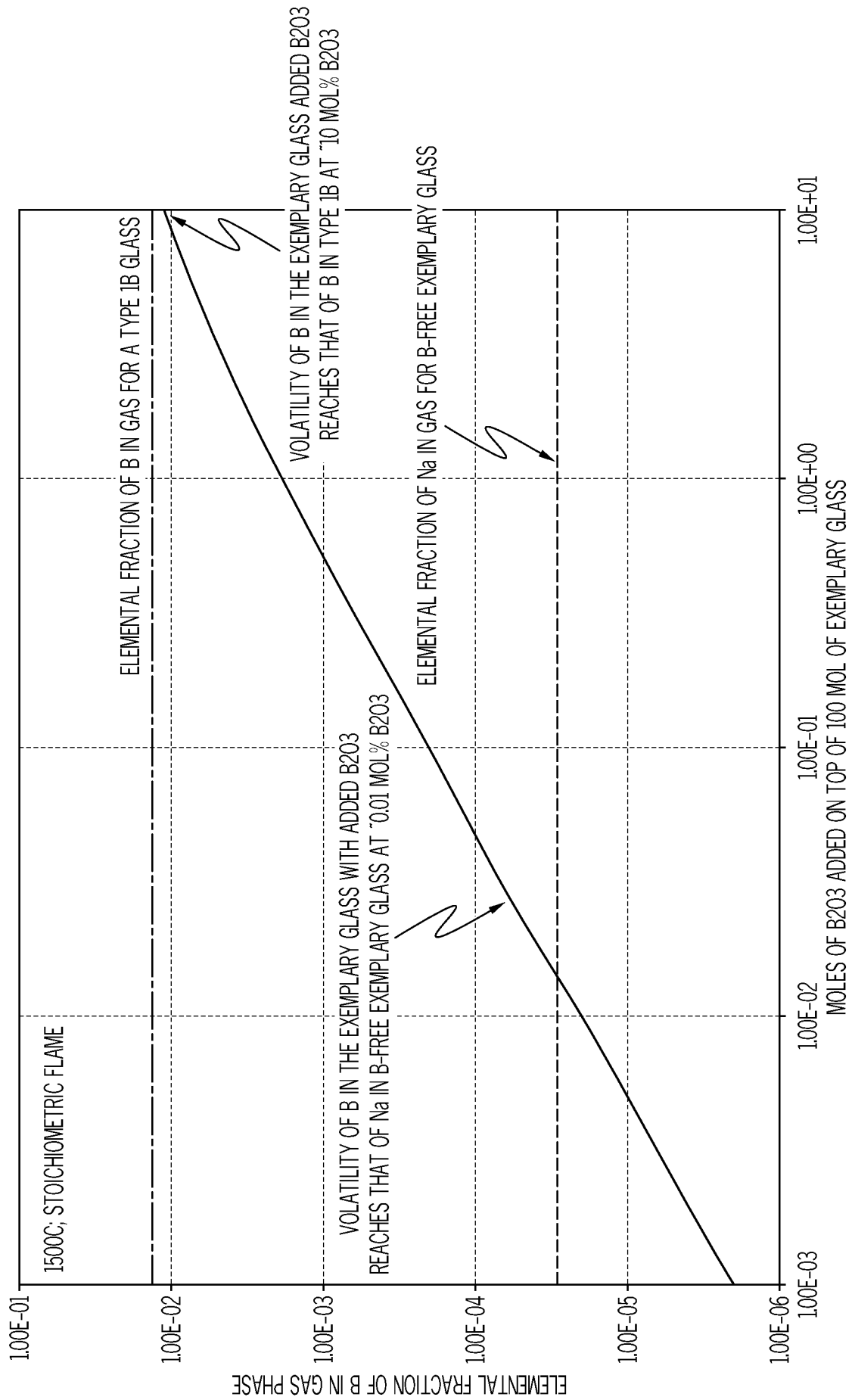


FIG. 29

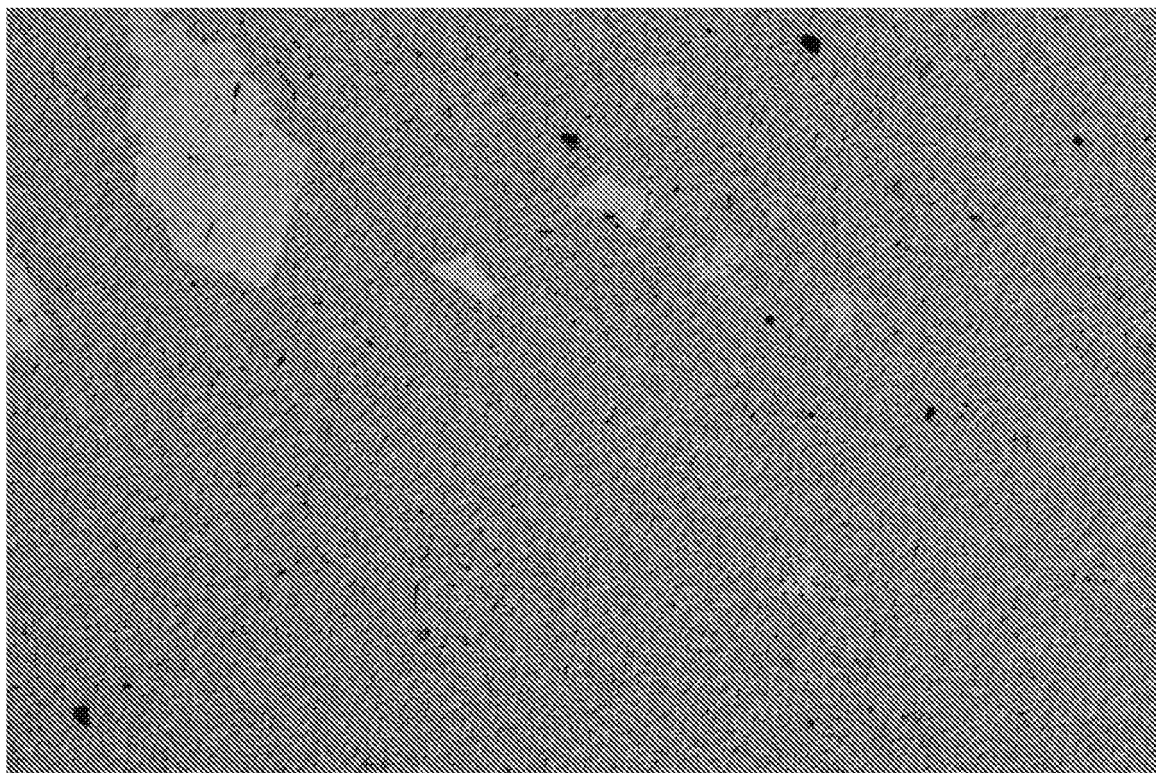


FIG. 30A

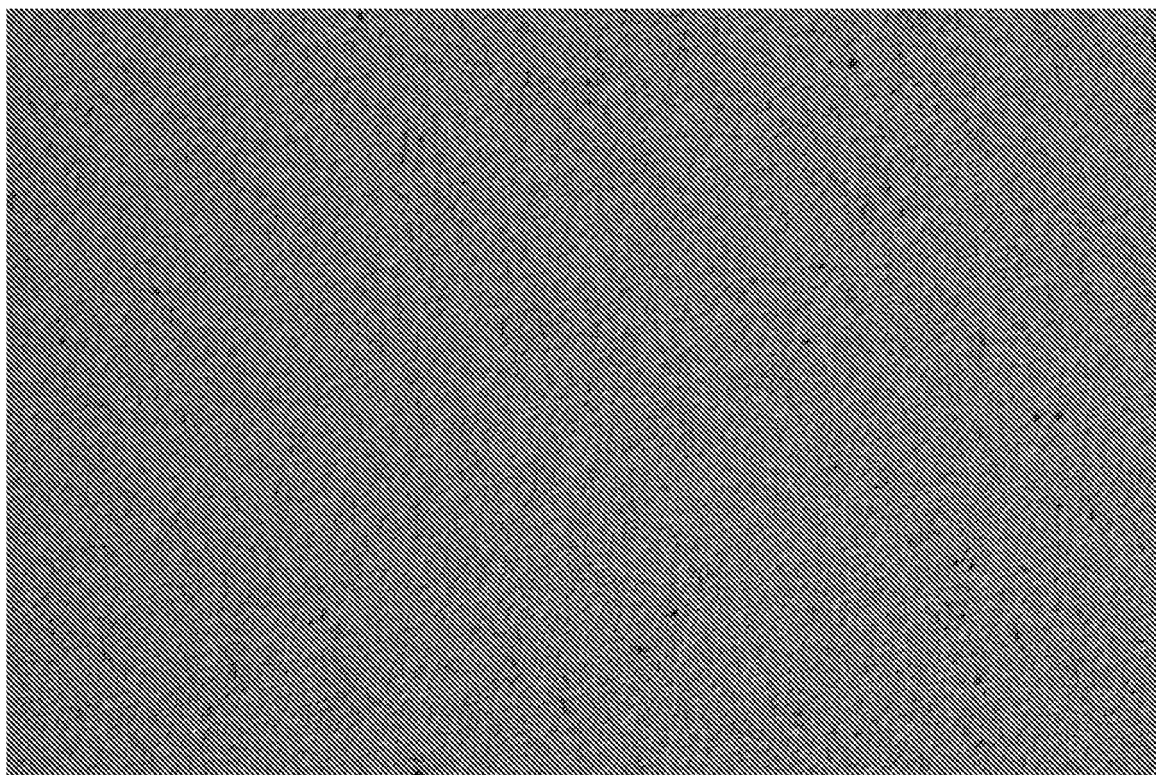


FIG. 30B

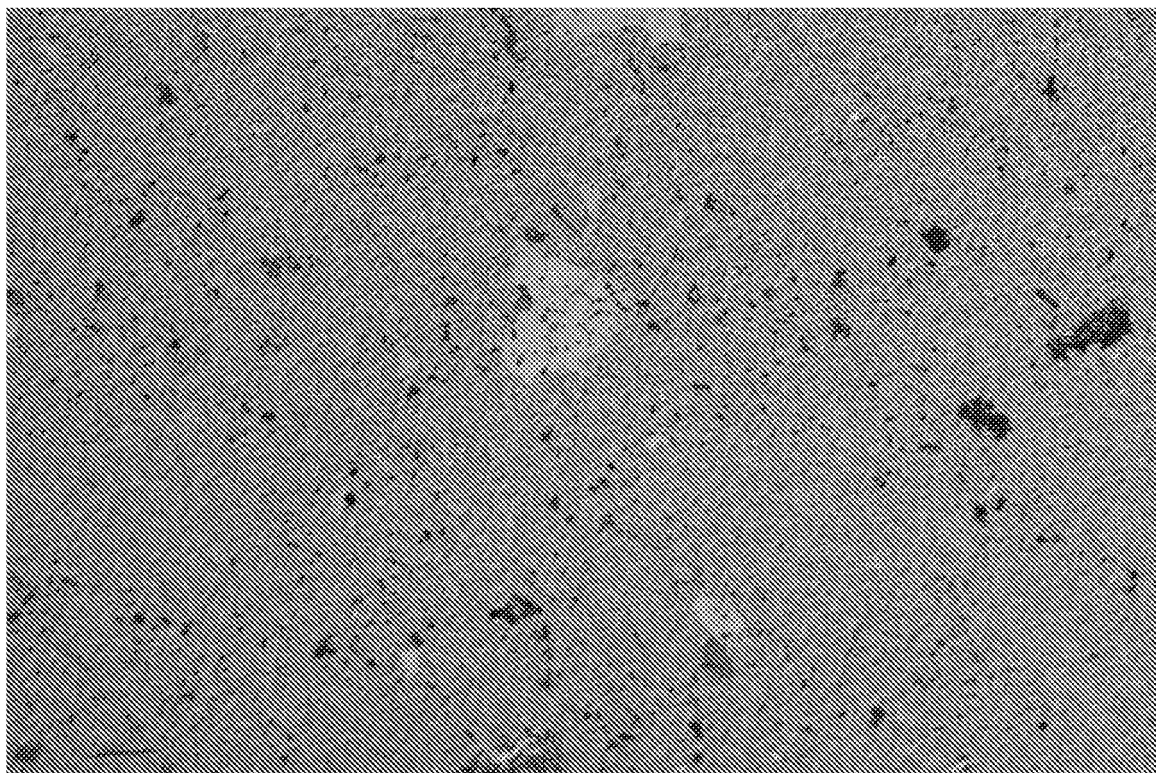


FIG. 31A

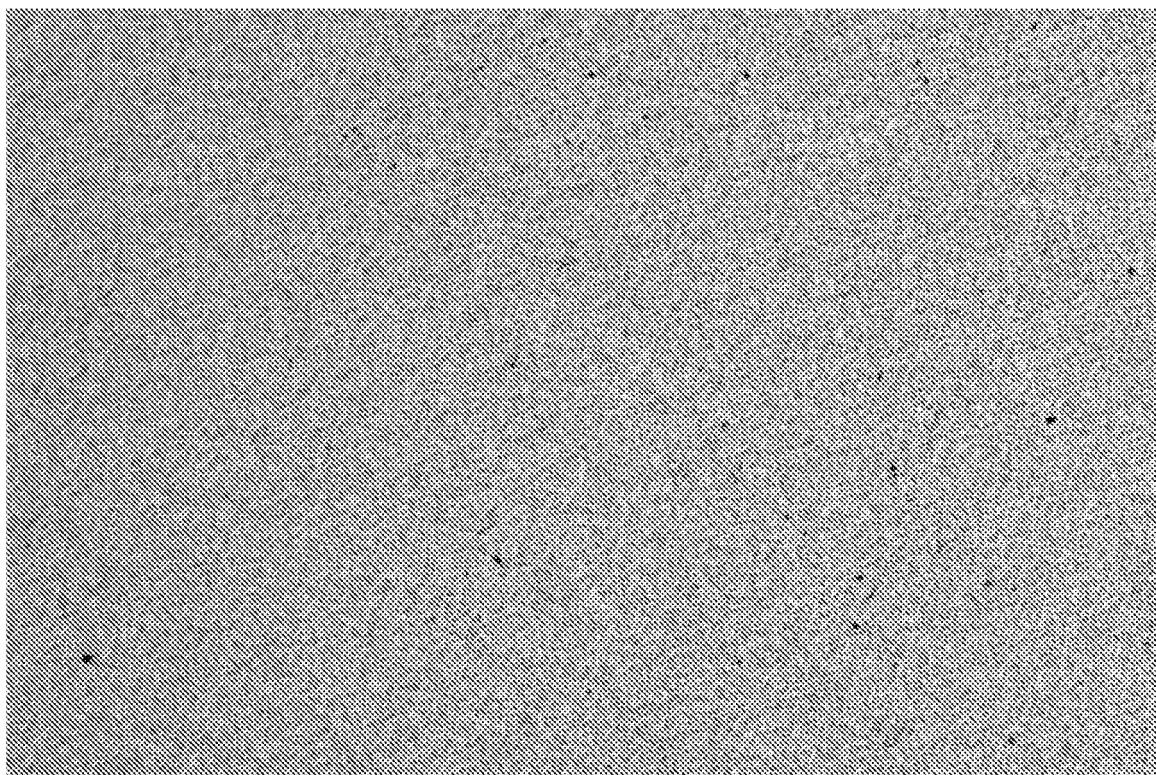


FIG. 31B

27 / 60

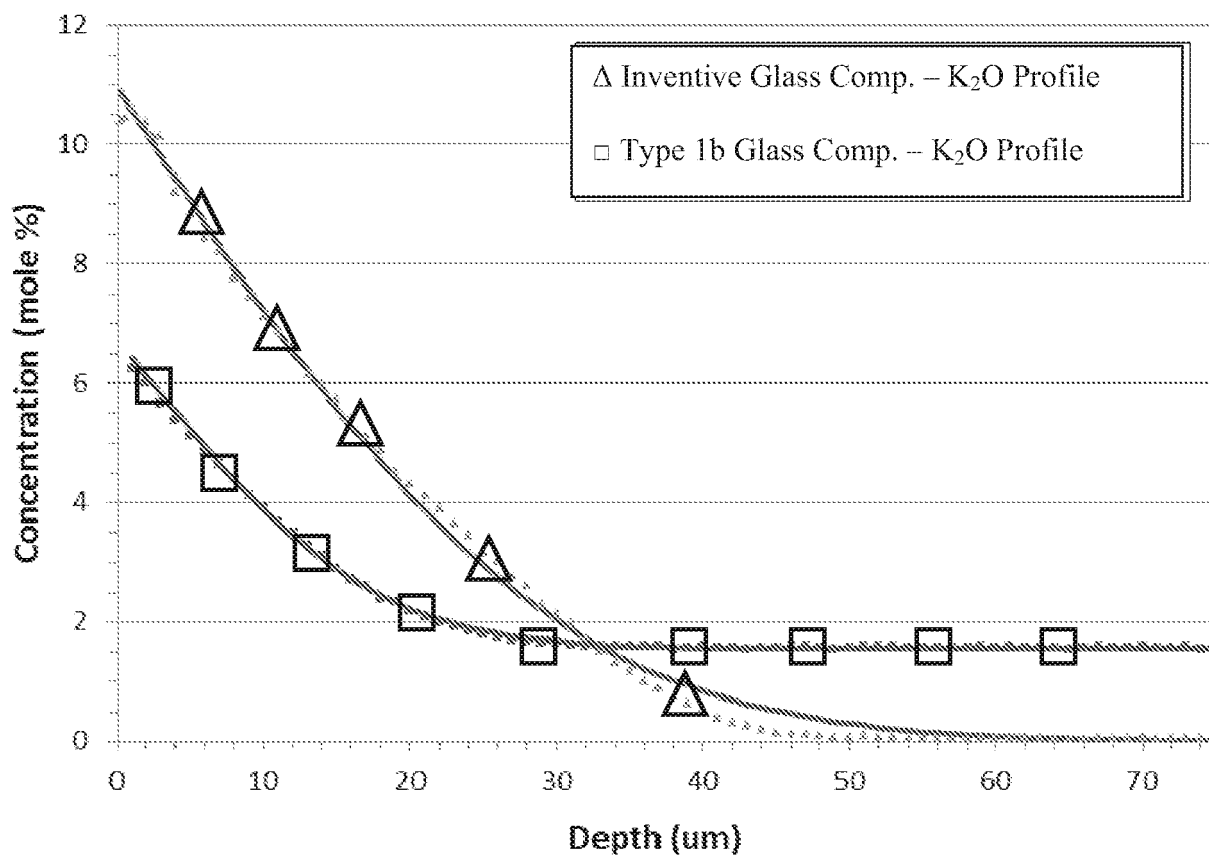


FIG. 32

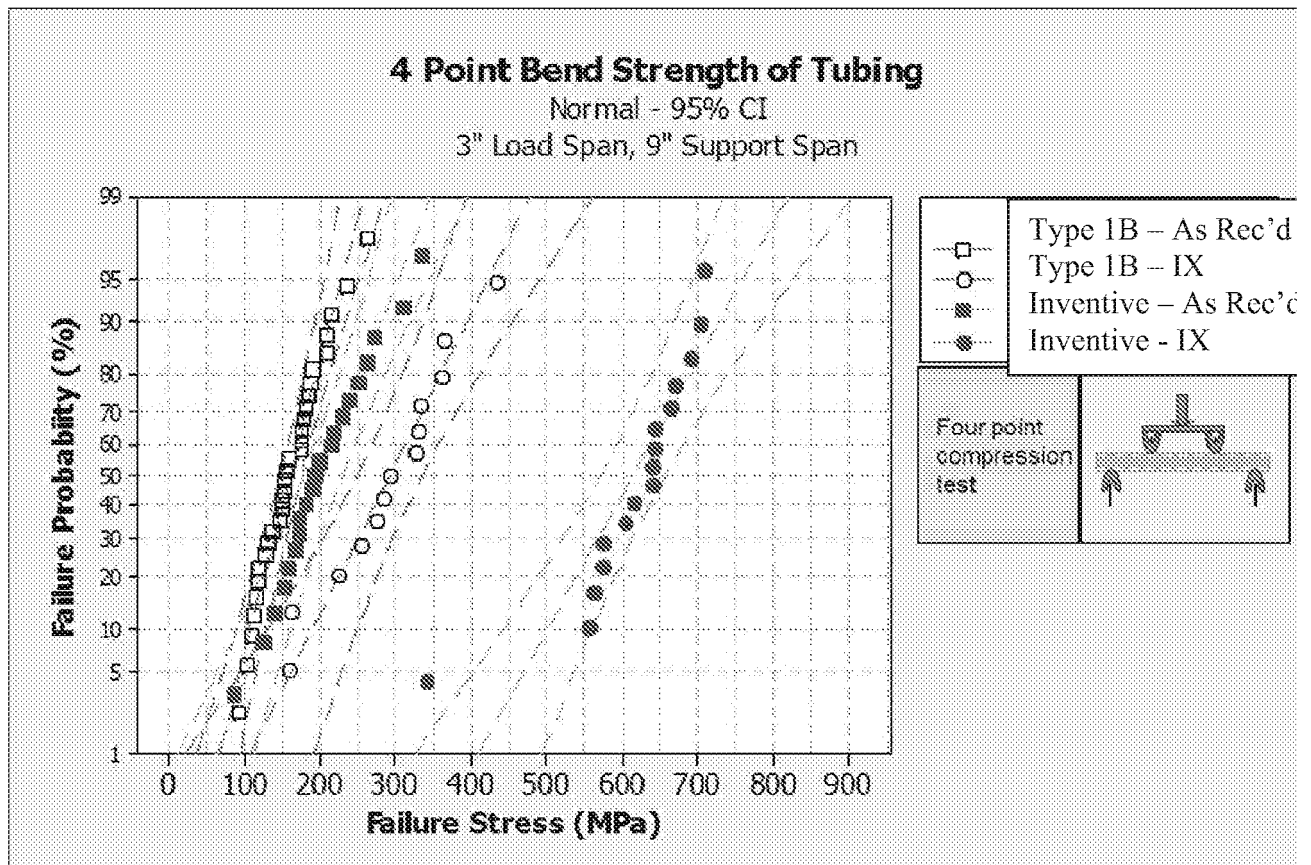


FIG. 33

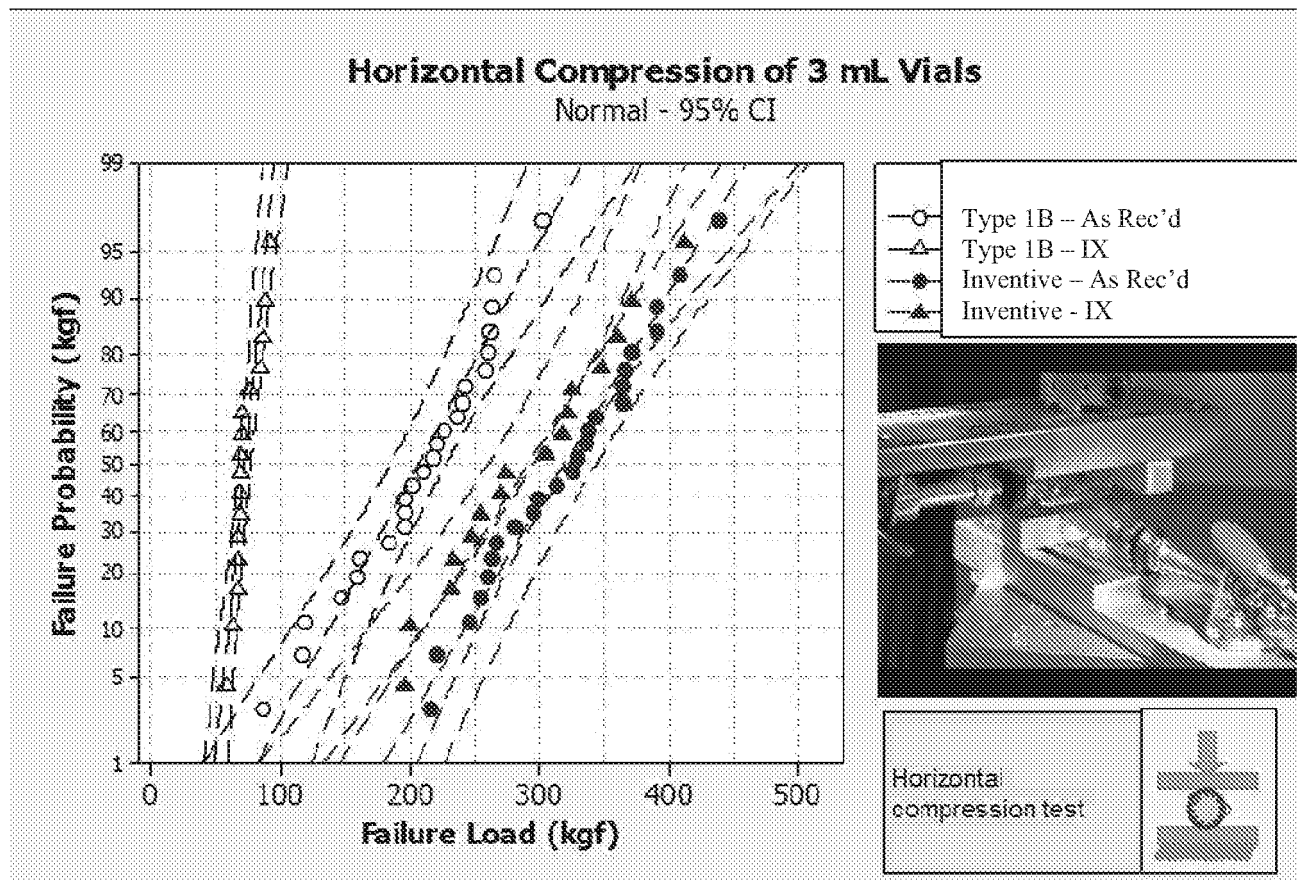


FIG. 34

30 / 60

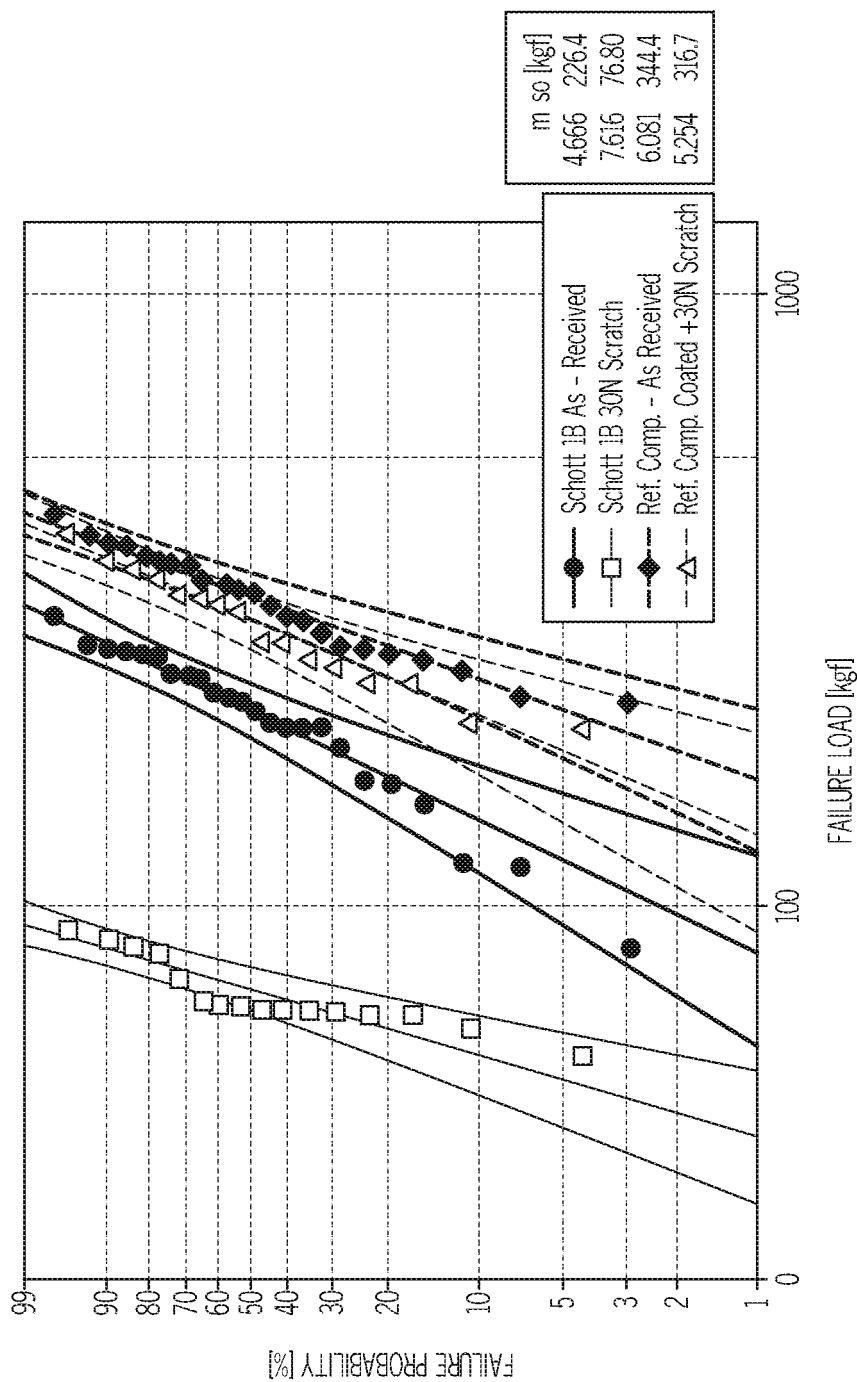


FIG. 35

30N SCRATCH ON TWO VIAL TYPES

|                                                | VIAL #'S | NORMAL LOAD (N) |    | AVG | MIN  | MAX  | AVG  | COF ST. DEV. | MAX |
|------------------------------------------------|----------|-----------------|----|-----|------|------|------|--------------|-----|
| REF. COMP. IX@450 COATED<br>0.1/0.1 APS/NOV800 | 1&2      | 31              | 28 | 34  | 0.42 | 0.18 | 0.66 |              |     |
|                                                | 3&4      | 31              | 29 | 36  | 0.45 | 0.18 | 0.7  |              |     |
|                                                | 5&6      | 30              | 28 | 34  | 0.45 | 0.11 | 0.64 |              |     |
|                                                | 7&8      | 29              | 26 | 32  | 0.33 | 0.14 | 0.54 |              |     |
|                                                | 9&10     | 30              | 28 | 33  | 0.16 | 0.15 | 0.59 |              |     |
|                                                | 11&12    | 28              | 25 | 33  | 0.16 | 0.09 | 0.6  |              |     |
|                                                | 12&14    | 30              | 29 | 33  | 0.22 | 0.16 | 0.61 |              |     |
|                                                | 15&16    | 31              | 28 | 35  | 0.53 | 0.11 | 0.71 |              |     |
|                                                | AVERAGE  | 30              | 28 | 34  | 0.38 | 0.14 | 0.63 |              |     |
|                                                |          |                 |    |     |      |      |      |              |     |
|                                                | 1&2      | 30              | 28 | 31  | 0.12 | 0.04 | 0.34 |              |     |
|                                                | 3&4      | 28              | 24 | 31  | 0.16 | 0.08 | 0.34 |              |     |
|                                                | 5&6      | 40              | 30 | 44  | 0.08 | 0.02 | 0.19 |              |     |
|                                                | 7&8      | 30              | 27 | 31  | 0.08 | 0.05 | 0.38 |              |     |
|                                                | 9&10     | 30              | 28 | 30  | 0.08 | 0.03 | 0.22 |              |     |
|                                                | 11&12    | 31              | 30 | 33  | 0.12 | 0.04 | 0.23 |              |     |
|                                                | 12&14    | 30              | 29 | 32  | 0.15 | 0.07 | 0.41 |              |     |
|                                                | 15&16    | 30              | 28 | 32  | 0.09 | 0.02 | 0.19 |              |     |
|                                                | AVERAGE  | 31              | 28 | 33  | 0.11 | 0.04 | 0.29 |              |     |
|                                                |          |                 |    |     |      |      |      |              |     |

FIG. 36

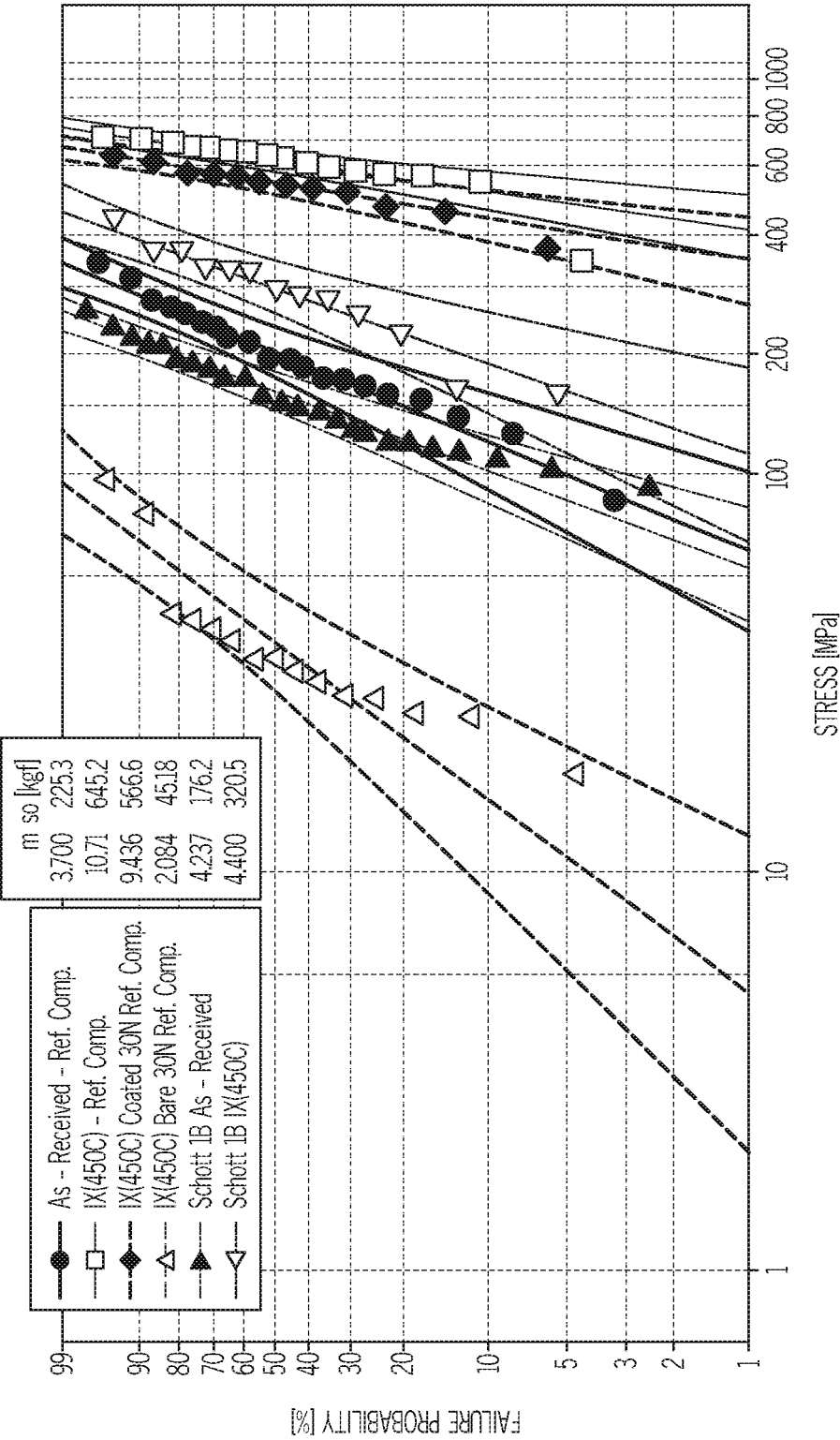


FIG. 37

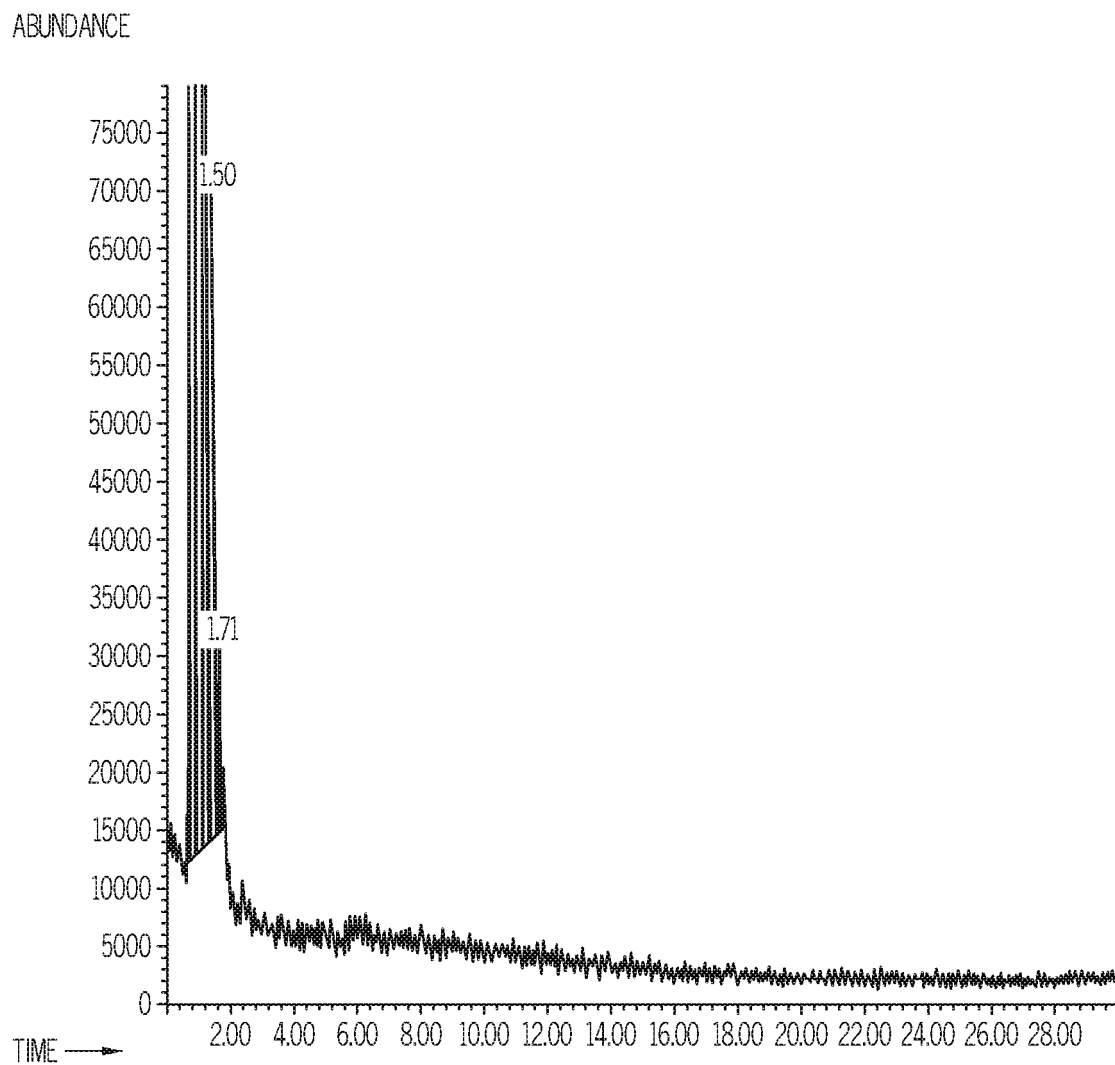


FIG. 38

34 / 60

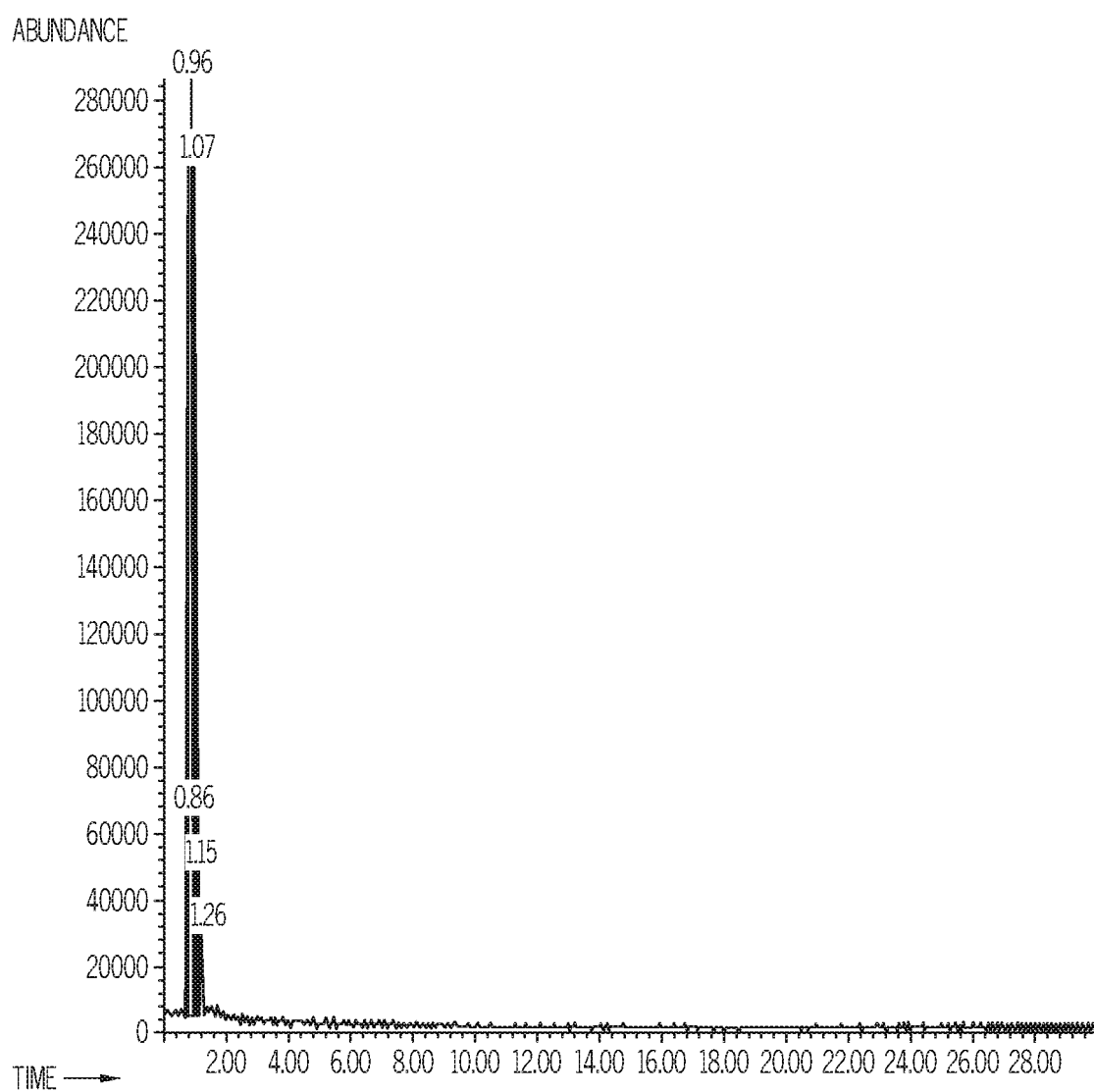


FIG. 39

35 / 60

| FORMULATION          | RELATIVE THICKNESS | CONDITION        |
|----------------------|--------------------|------------------|
| 0.1% APS/1.0% KAPTON | 10                 | AS IS            |
| 0.1% APS/0.1% KAPTON | 1                  | AS IS            |
|                      |                    |                  |
| 0.1 APS 0.5 DC806A   | 5                  | 1 H TUMBLE       |
| 0.1 APS 0.1 DC806A   | 1                  | 1 H TUMBLE       |
| 0.1 APS 0.1 KAPTON   | 1                  | 1 H TUMBLE       |
| 0.1 APS 0.5 KAPTON   | 5                  | 1 H TUMBLE       |
| 1.0% DC255           | 10                 | 0.5 H TUMBLE     |
| 1.0% DC255           | 10                 | 1 H TUMBLE       |
| 1.0% DC255           | 10                 | 2 H TUMBLE       |
| 1.0% DC255           | 10                 | AS IS            |
| 1.0% KAPTON          | 10                 | FILING LINE      |
| 0.1 APS 0.1 NOVA800  | 1                  | 6 MIN TUMBLE     |
| 0.1 APS 0.1 NOVA800  | 1                  | 15 MIN TUMBLE    |
| 1.0 GAPS/1.0 DC806A  | 10                 | 6 MIN TUMBLE     |
| 1.0 GAPS/1.0 DC806A  | 10                 | 15 MIN TUMBLE    |
| 1.0 GAPS/1.0 DC806A  | 10                 | AS IS            |
| 0.1 APS 0.1 NOVA800  | 1                  | AS IS            |
| TYPE 1B BARE         | 0                  | 30N (3), 50N (1) |
| 1.0 GAPS/1.0 DC806A  | 10                 | 30N SCRATCH 3    |
| 1.0 GAPS/1.0 DC806A  | 10                 | 50N SCRATCH 1    |
| 0.1 APS 0.1 NOVA800  | 1                  | 30N SCRATCH 3    |
| 0.1 APS 0.1 NOVA800  | 1                  | 50N SCRATCH 1    |

FIG. 40

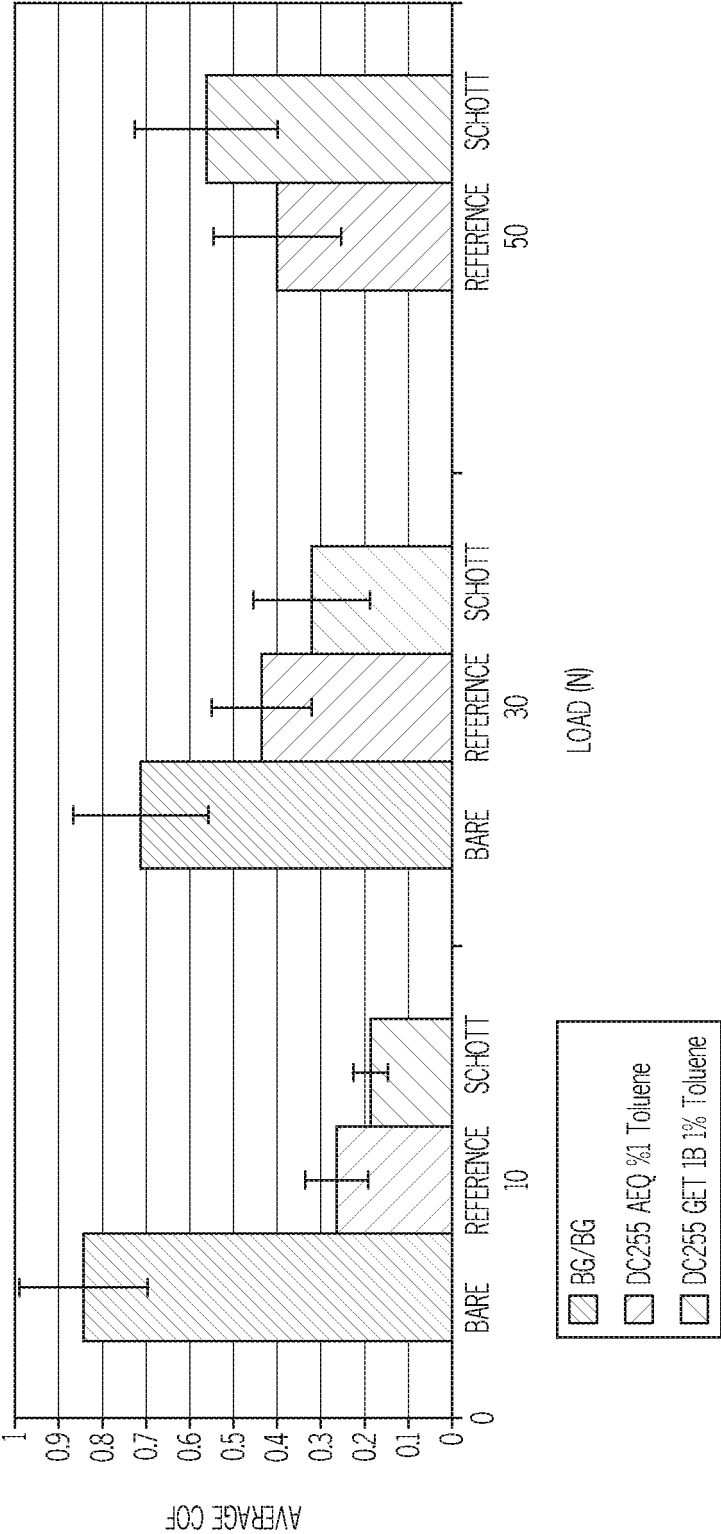


FIG. 41

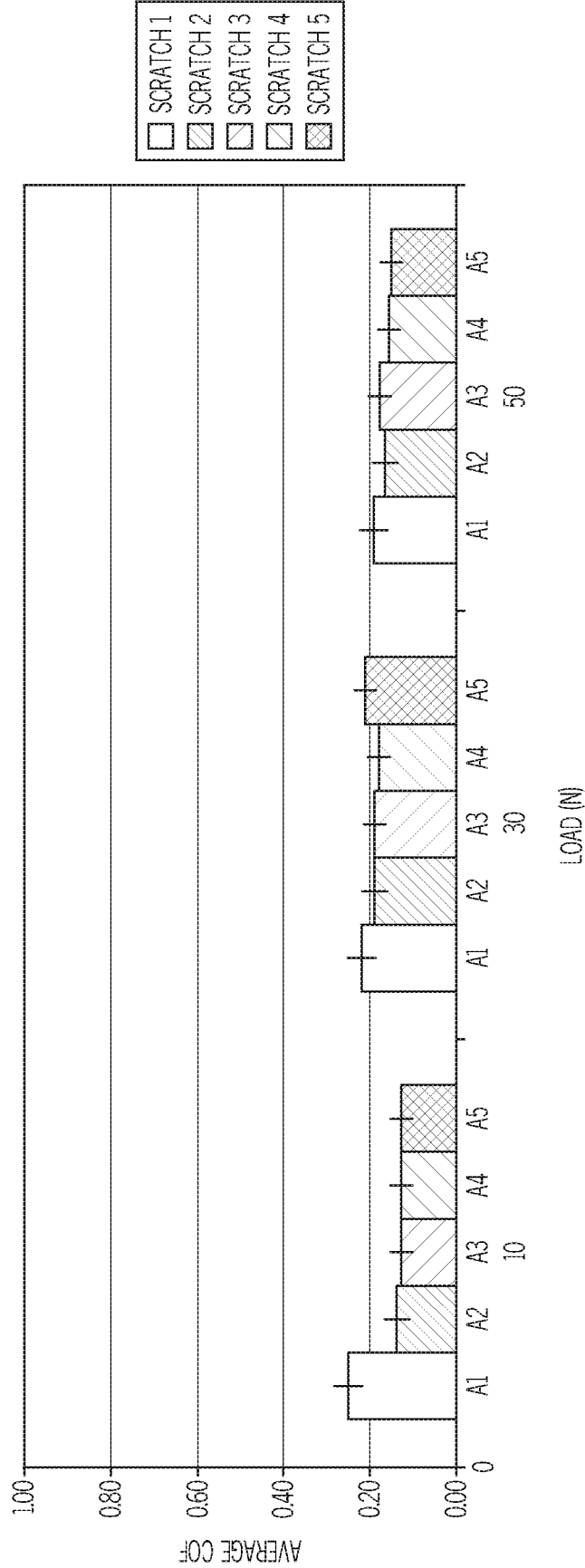


FIG. 42

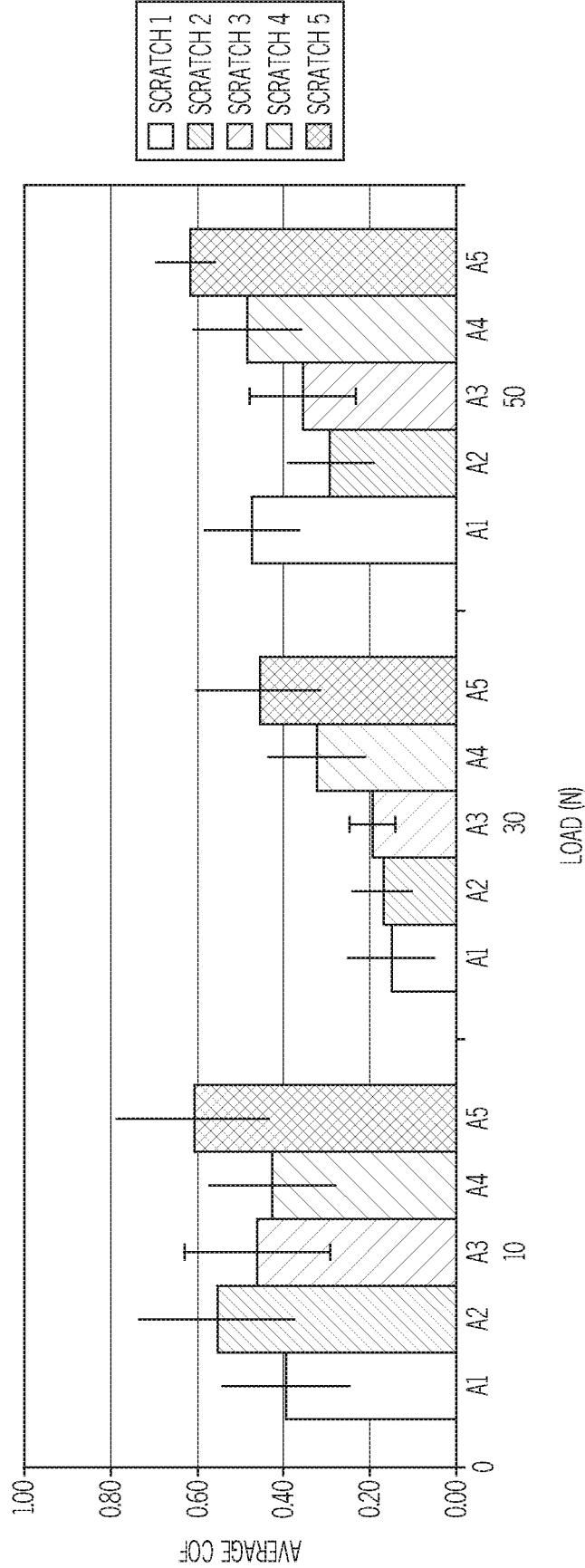


FIG. 43

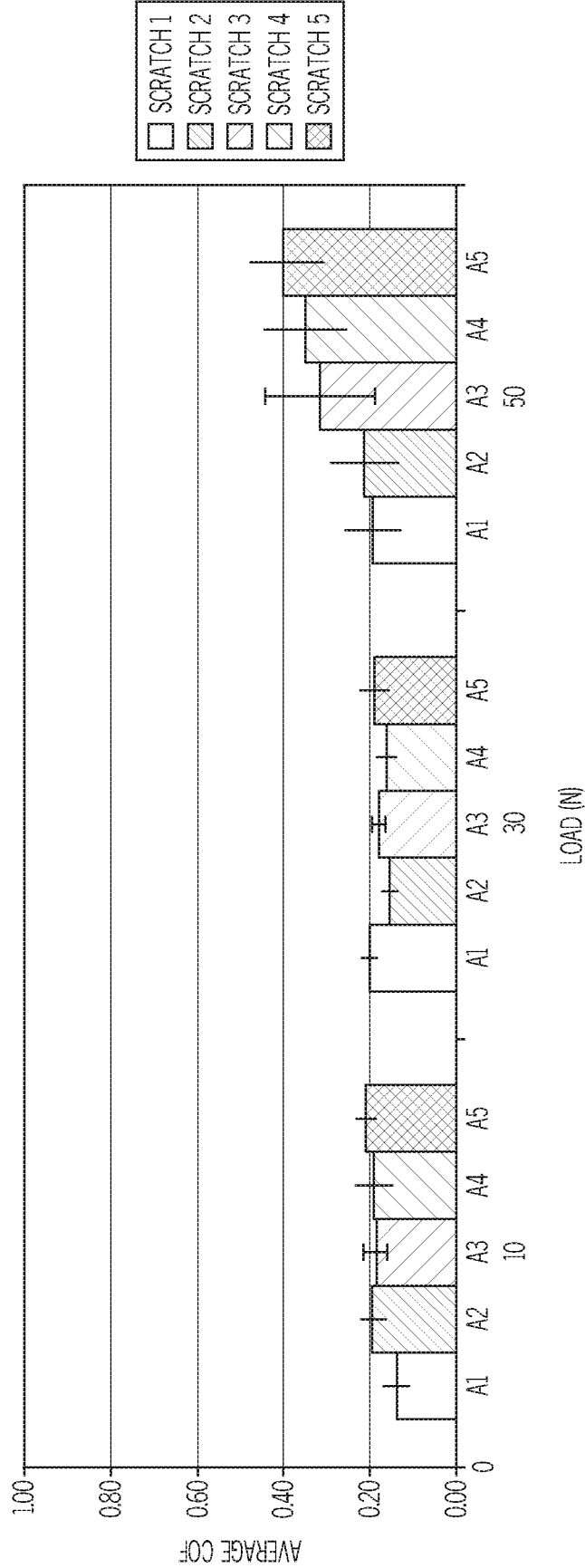


FIG. 44

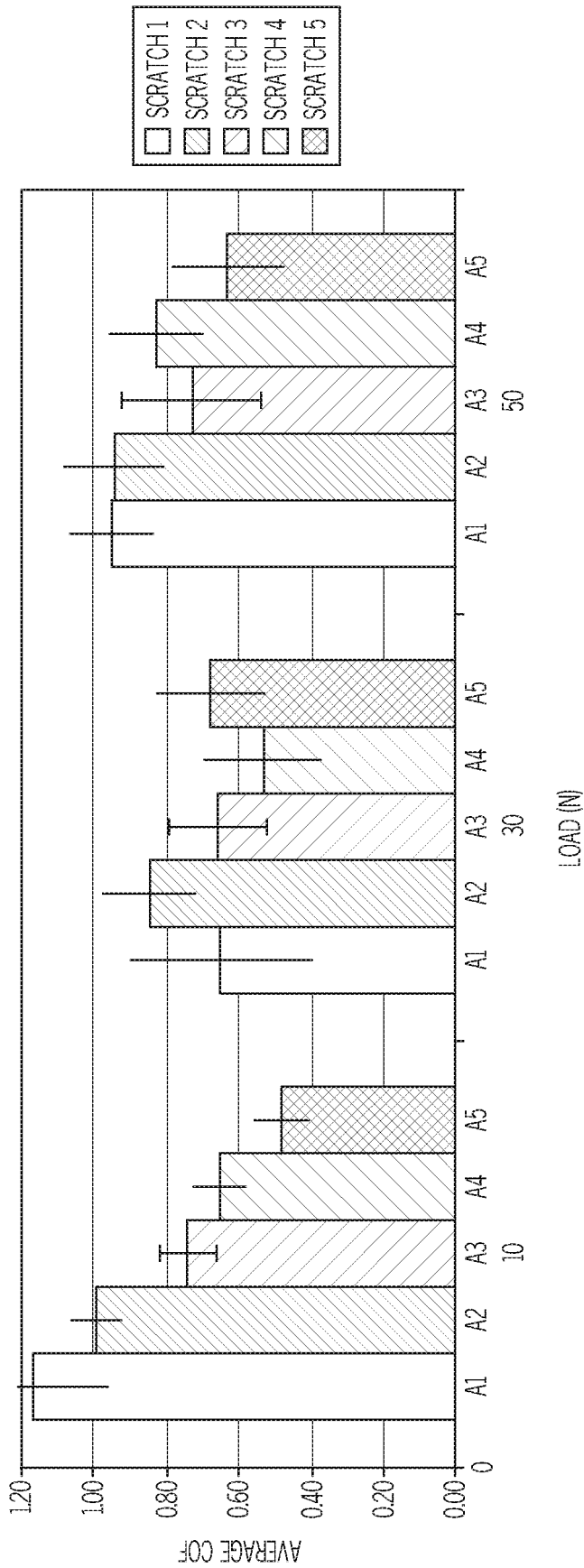


FIG. 45

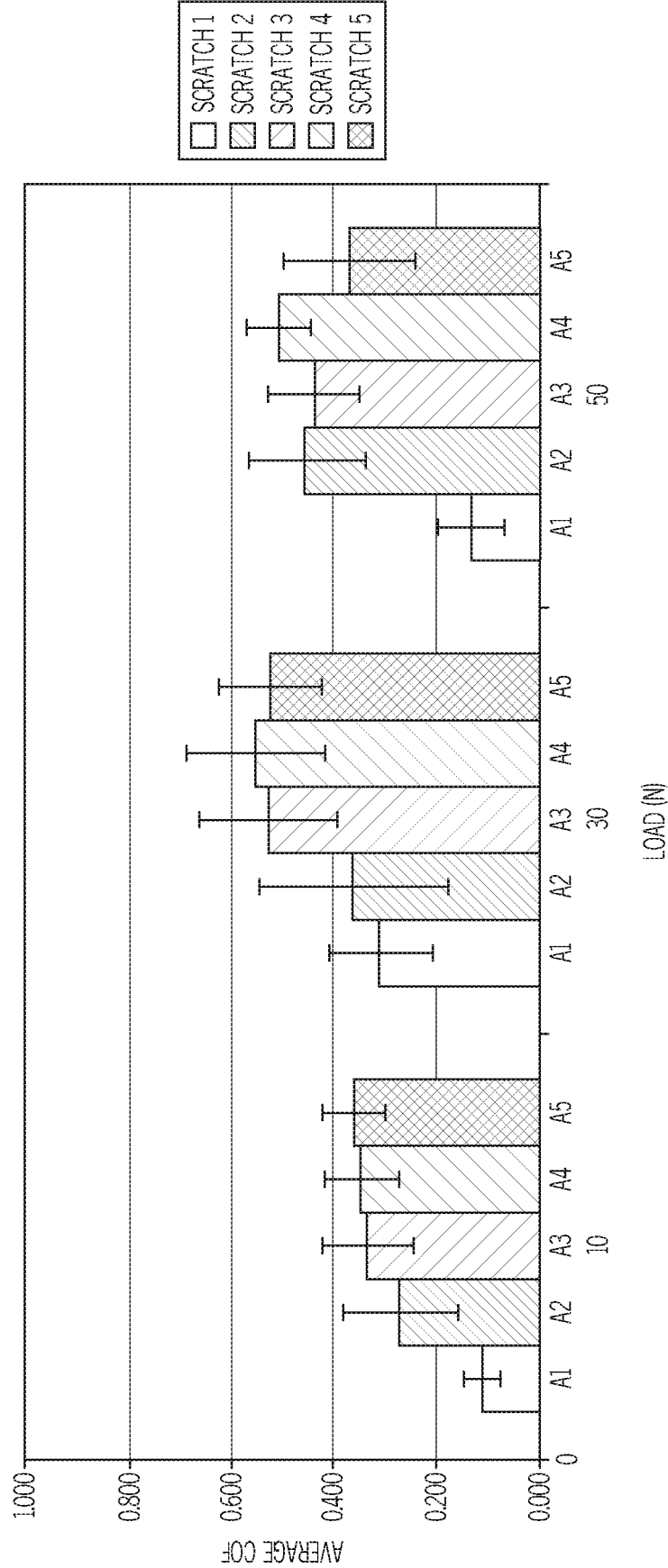


FIG. 46

| BEFORE |        |     |          |      |        |  |
|--------|--------|-----|----------|------|--------|--|
| VIALS  | Z-LOAD |     | COF      |      | FX MAX |  |
|        | AVG    | MAX | ST. DEV. | MAX  |        |  |
| 1&2    | 34     | 36  | 0.03     | 0.23 | 8      |  |
| 3&4    | 30     | 32  | 0.02     | 0.18 | 5      |  |
| 5&6    | 34     | 36  | 0.02     | 0.19 | 6      |  |
| 7&8    | 31     | 33  | 0.01     | 0.02 | 4      |  |
| 9&10   | 31     | 33  | 0.01     | 0.14 | 4      |  |

| AFTER                    |        |     |          |      |        |  |
|--------------------------|--------|-----|----------|------|--------|--|
| 3) APS/NOVA LYOPHILLIZED |        |     |          |      |        |  |
| VIALS                    | Z-LOAD |     | COF      |      | FX MAX |  |
|                          | AVG    | MAX | ST. DEV. | MAX  |        |  |
| 1&2                      | 37     | 39  | 0.01     | 0.09 | 3      |  |
| 3&4                      | 40     | 43  | 0.01     | 0.14 | 6      |  |
| 5&6                      | 30     | 31  | 0.01     | 0.09 | 3      |  |
| 7&8                      | 30     | 31  | 0.01     | 0.07 | 2      |  |
| 9&10                     | 30     | 32  | 0.01     | 0.16 | 5      |  |

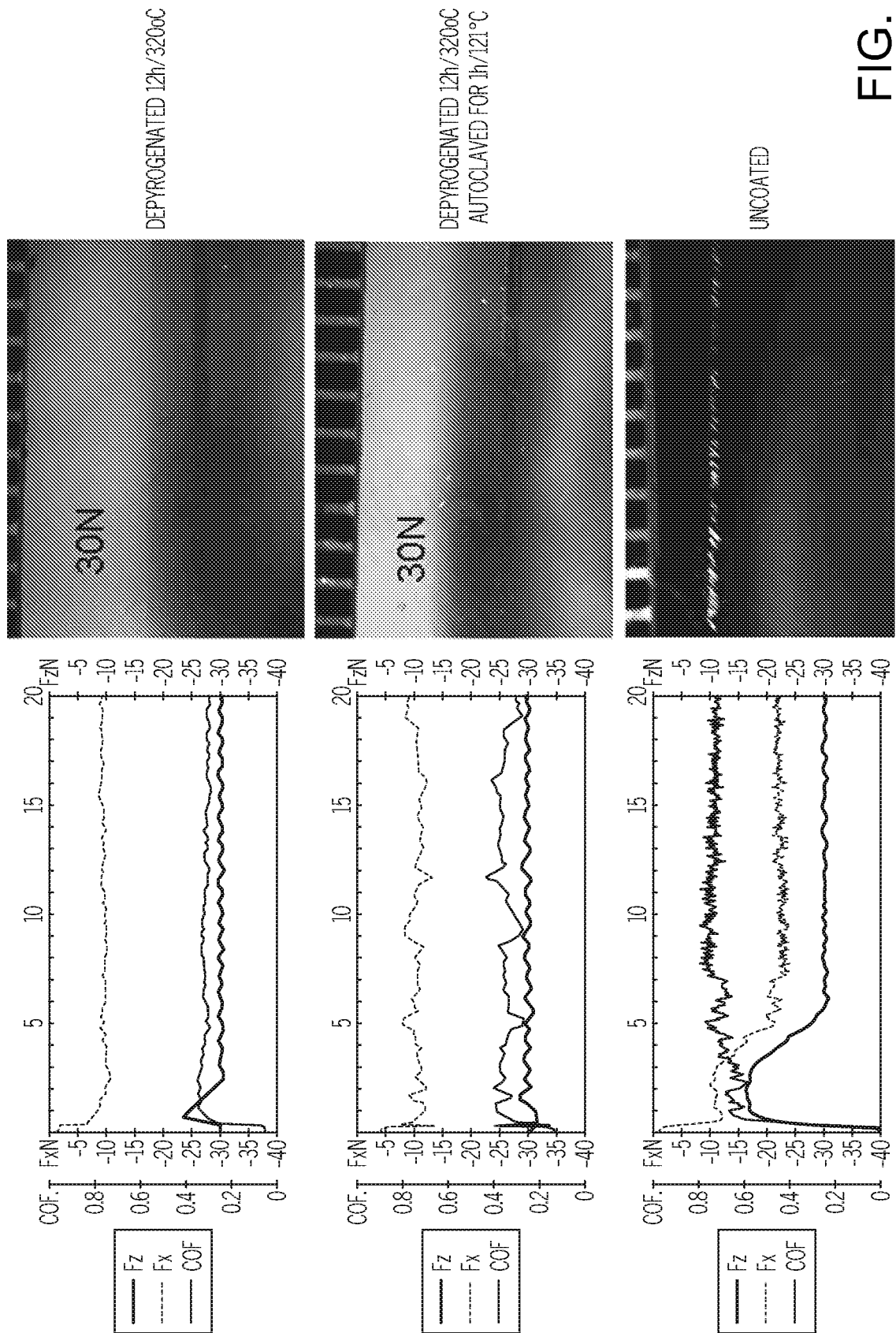
FIG. 47

| VIALS | Z-LOAD |     | COF  |          | FX MAX |
|-------|--------|-----|------|----------|--------|
|       | AVG    | MAX | AVG  | ST. DEV. | MAX    |
| 1&2   | 34     | 36  | 0.11 | 0.03     | 0.23   |
| 3&4   | 30     | 32  | 0.14 | 0.02     | 0.18   |
| 5&6   | 34     | 36  | 0.09 | 0.02     | 0.19   |
| 7&8   | 31     | 33  | 0.07 | 0.01     | 0.02   |
| 9&10  | 31     | 33  | 0.08 | 0.01     | 0.14   |

2) APS/NOVA AUTOCLAVED

| VIALS | Z-LOAD |     | COF  |          | FX MAX |
|-------|--------|-----|------|----------|--------|
|       | AVG    | MAX | AVG  | ST. DEV. | MAX    |
| 1&2   | 36     | 39  | 0.08 | 0.02     | 0.18   |
| 3&4   | 37     | 40  | 0.09 | 0.01     | 0.16   |
| 5&6   | 30     | 31  | 0.06 | 0.01     | 0.1    |
| 7&8   | 30     | 31  | 0.07 | 0.01     | 0.1    |
| 9&10  | 30     | 31  | 0.07 | 0.01     | 0.14   |

FIG. 48



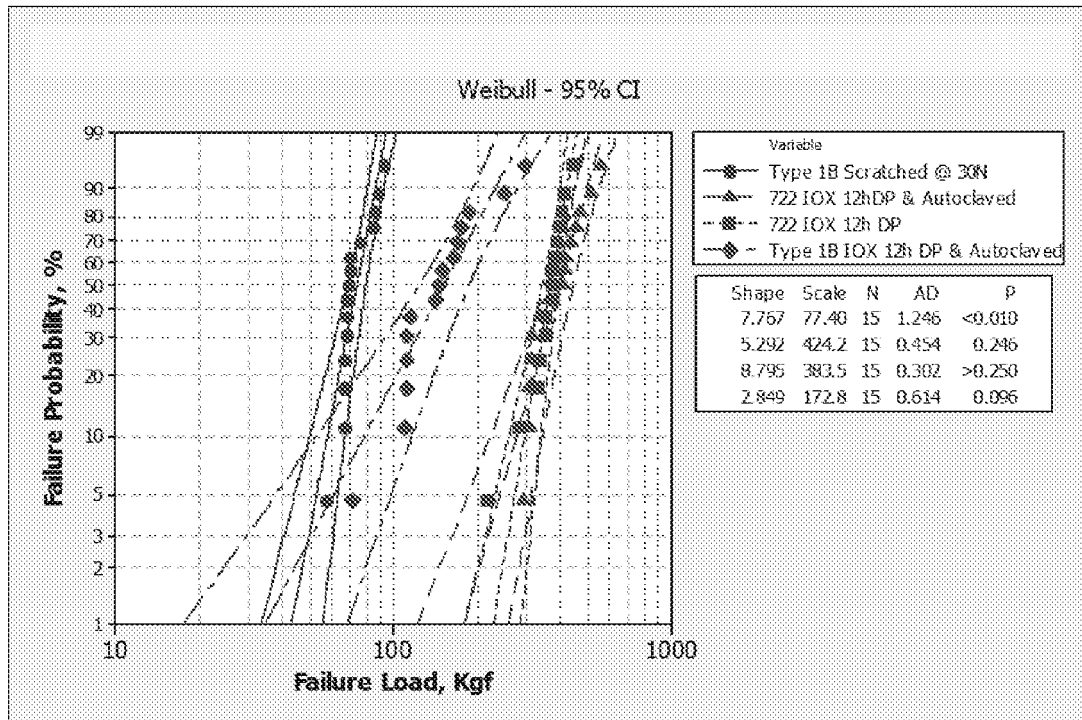


FIG. 50

| 12h DP Sample      |          | Silanes ratio |     | Coating composition                                  |  |        |     |
|--------------------|----------|---------------|-----|------------------------------------------------------|--|--------|-----|
| 540 #1             |          | 1:1           |     | 0.5 GAP/0.5 Aminophenyltrimethoxysilane + 1.0% Nova  |  |        |     |
| 540 #2             |          | 1:0.5         |     | 0.5 GAP/0.25 Aminophenyltrimethoxysilane + 1.0% Nova |  |        |     |
| 540 #3             |          | 1:0.2         |     | 0.5 GAP/0.1 Aminophenyltrimethoxysilane + 1.0% Nova  |  |        |     |
| 540<br>Target Load | Vial Set | Fz (N)        |     | COF                                                  |  | Fx (N) |     |
|                    |          | Avg           | Max | Std. Dev.                                            |  | Max    | Max |
|                    | 1        | 30            | 32  | 0.02                                                 |  | 0.26   | 8   |
|                    | 2        | 30            | 32  | 0.04                                                 |  | 0.41   | 13  |
| 20                 | 3        | 30            | 33  | 0.1                                                  |  | 0.68   | 19  |
|                    | 1        | 20            | 22  | 0.02                                                 |  | 0.24   | 5   |
|                    | 2        | 20            | 21  | 0.02                                                 |  | 0.31   | 6   |
|                    | 3        | 21            | 23  | 0.1                                                  |  | 0.61   | 13  |
|                    |          |               |     |                                                      |  |        |     |
|                    |          |               |     |                                                      |  |        |     |

FIG. 51

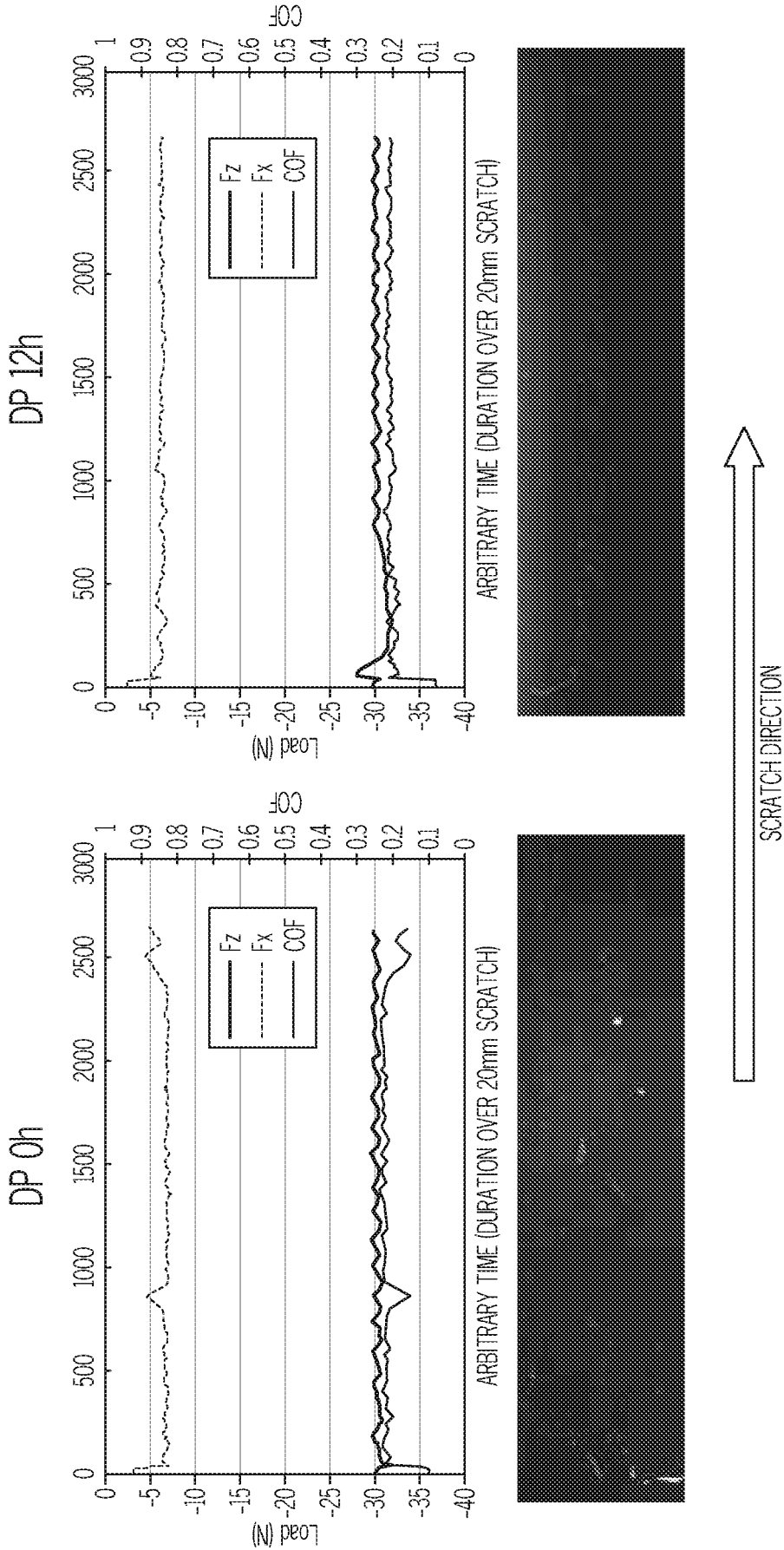
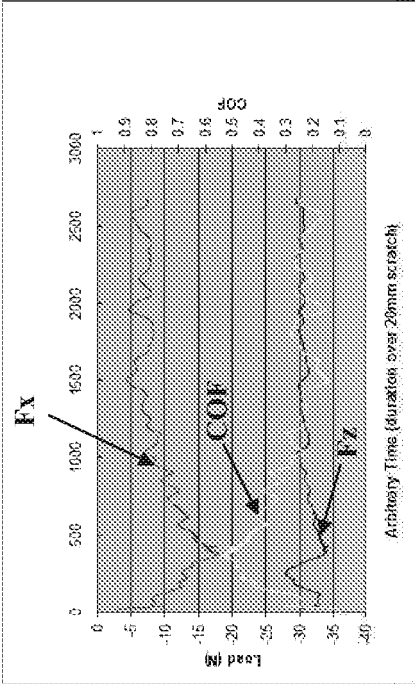


FIG. 52

Depyrogenated 12h at 320°C



As is

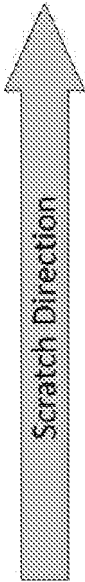
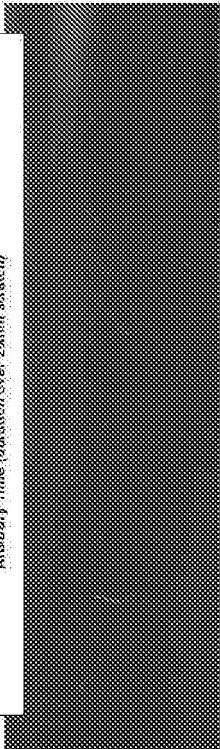
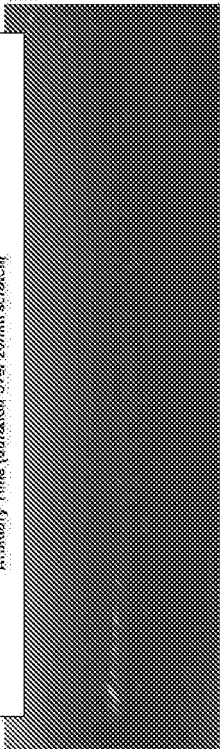
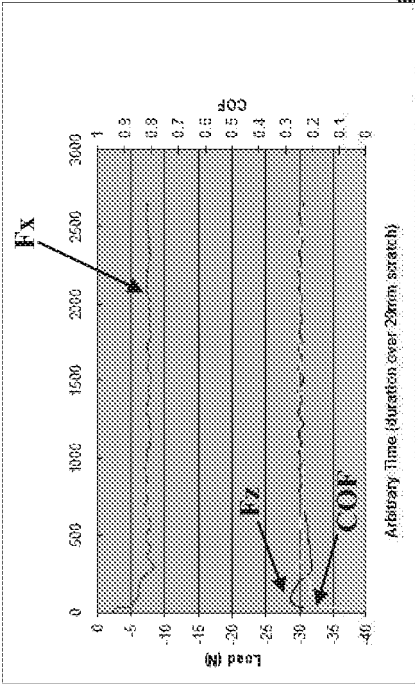


FIG. 53

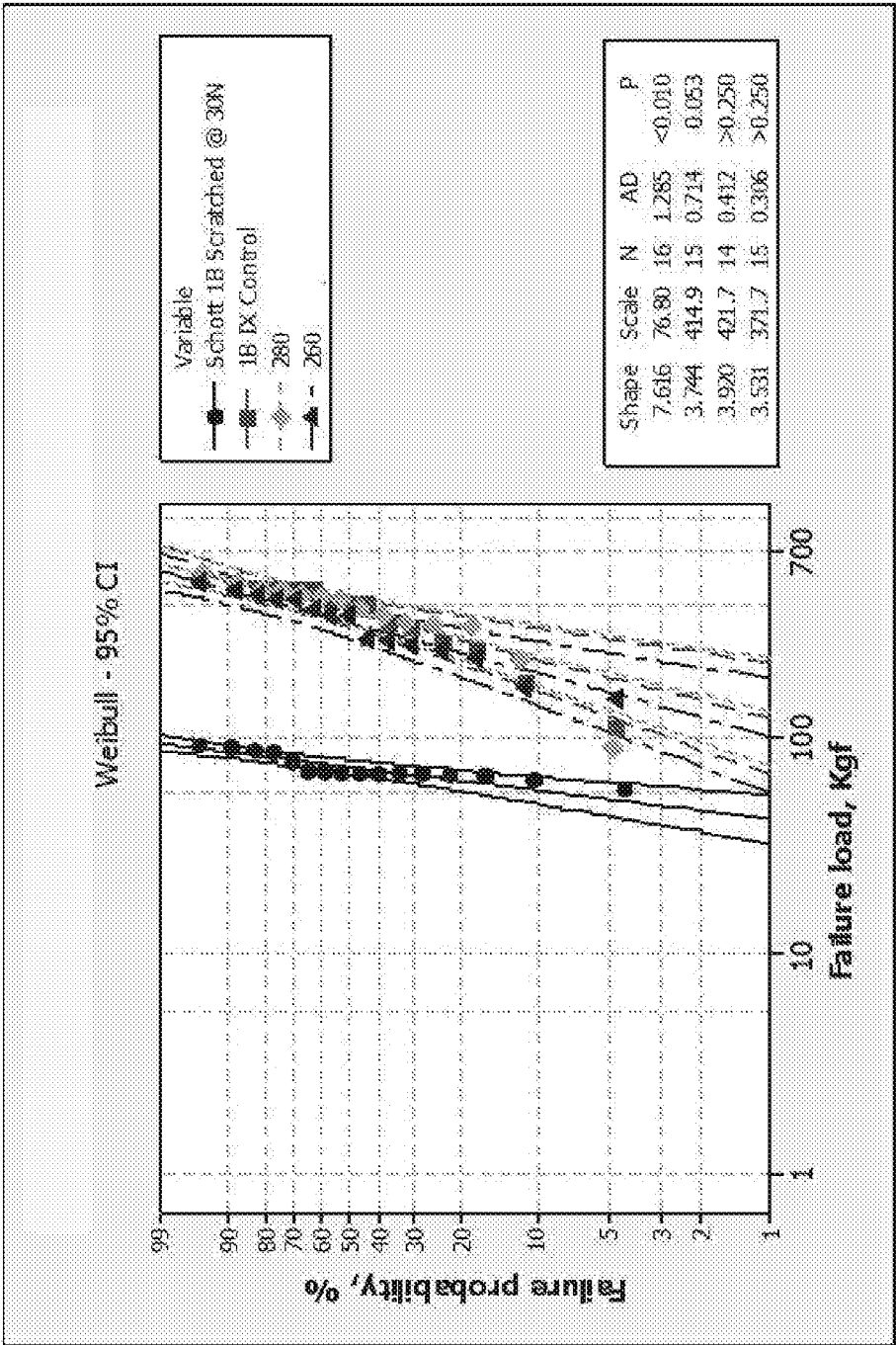
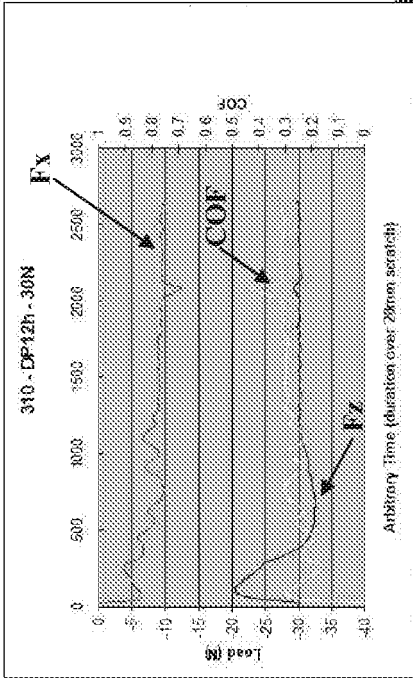


FIG. 54

Depyrogenated 12h at 320°C



As is

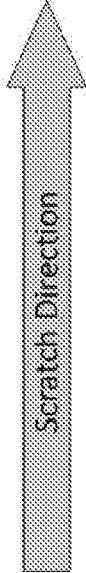
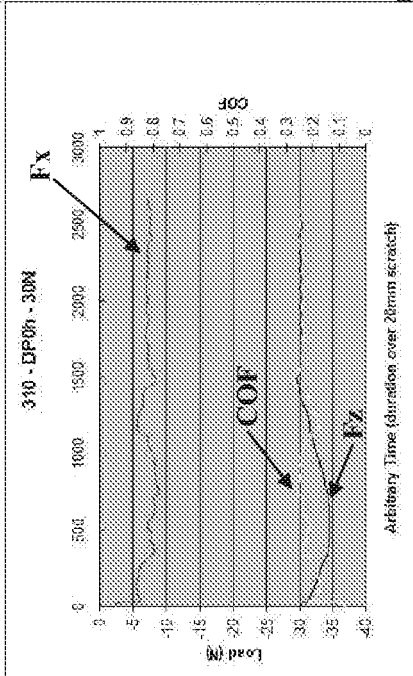


FIG. 55

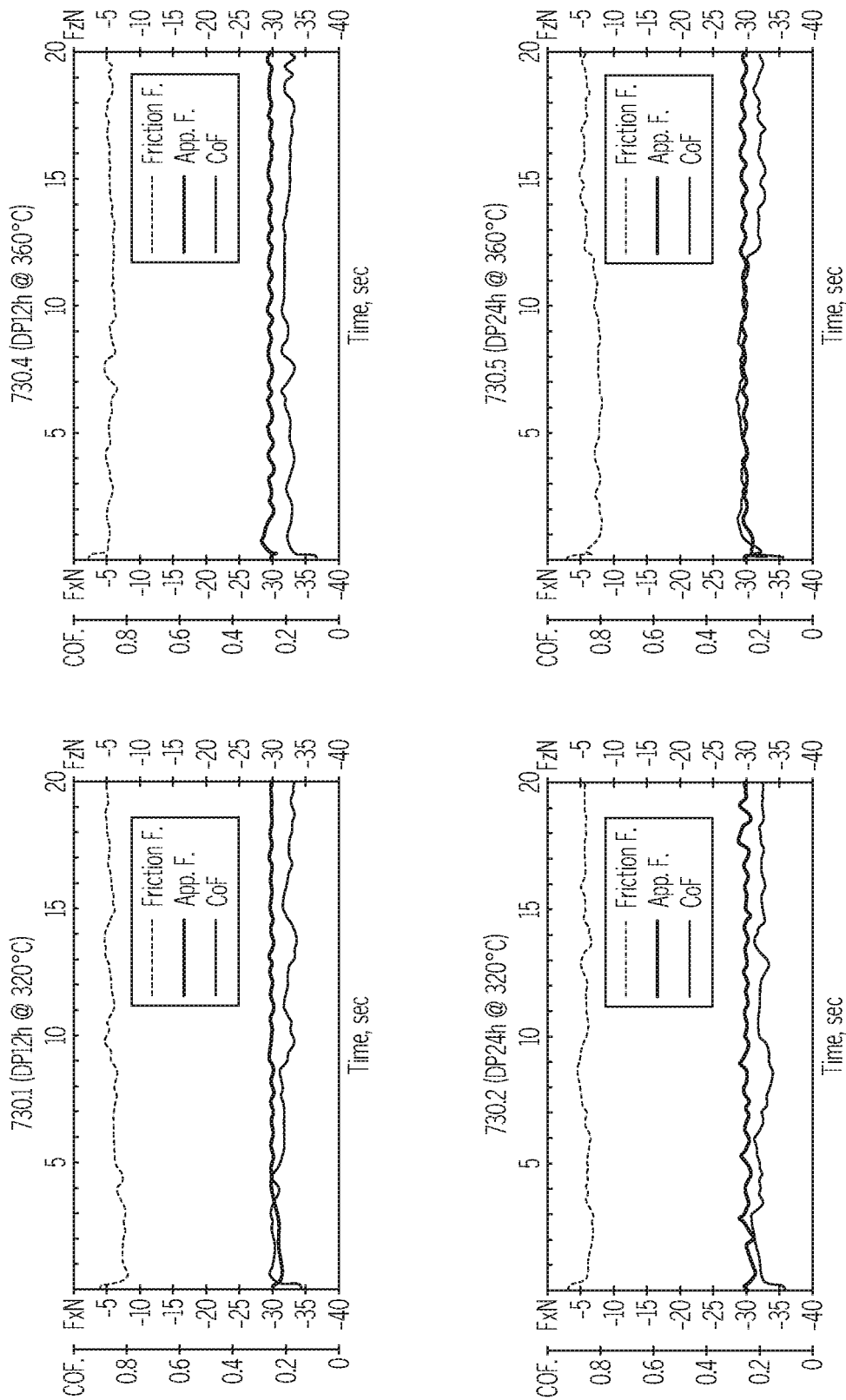


FIG. 56

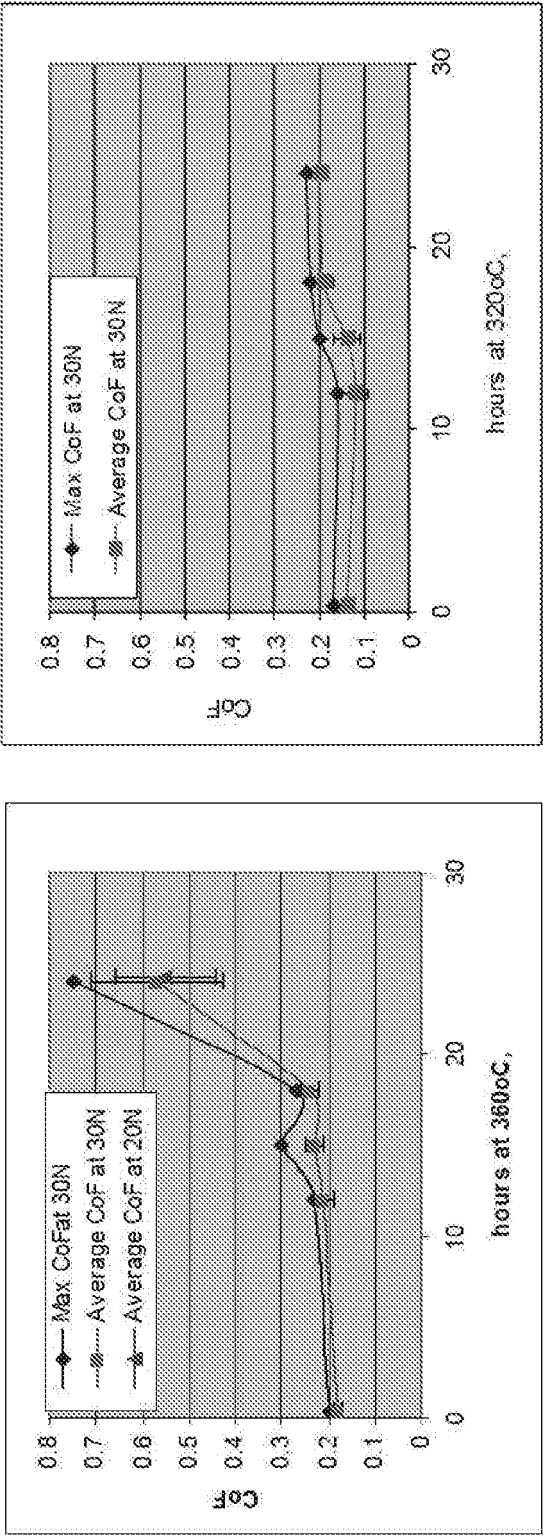


FIG. 57

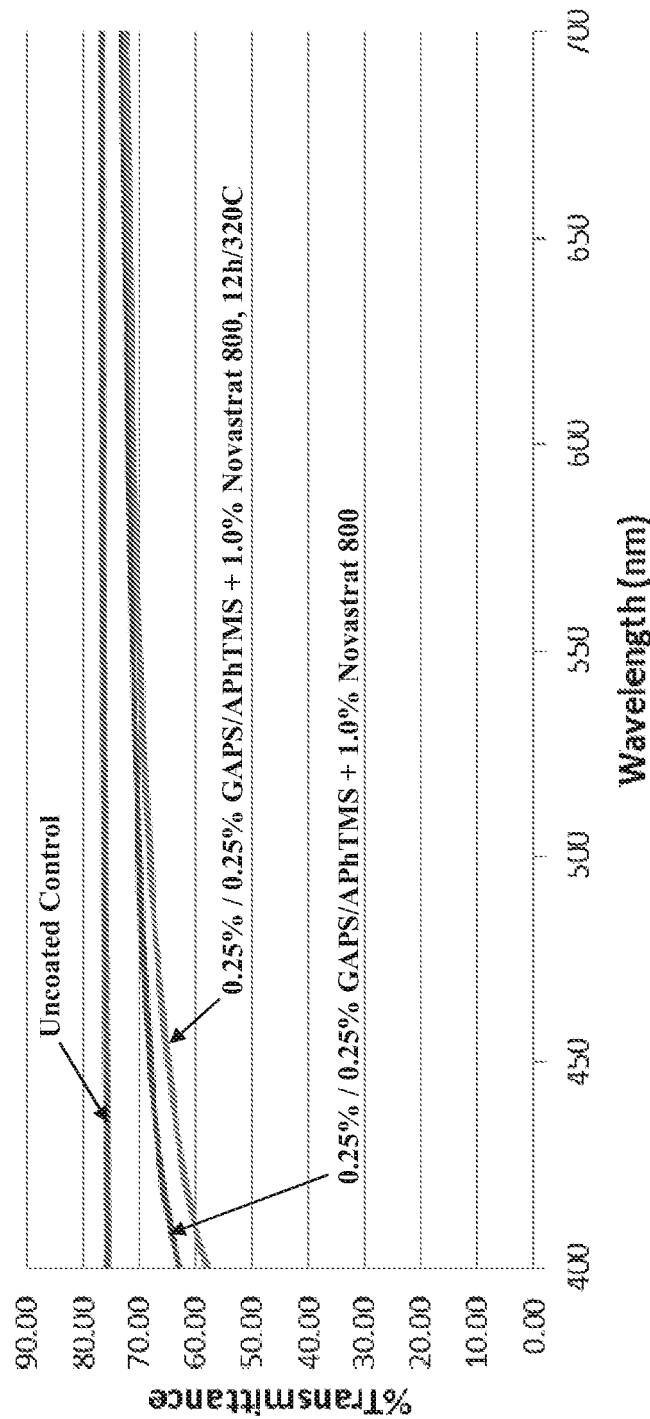


FIG. 58

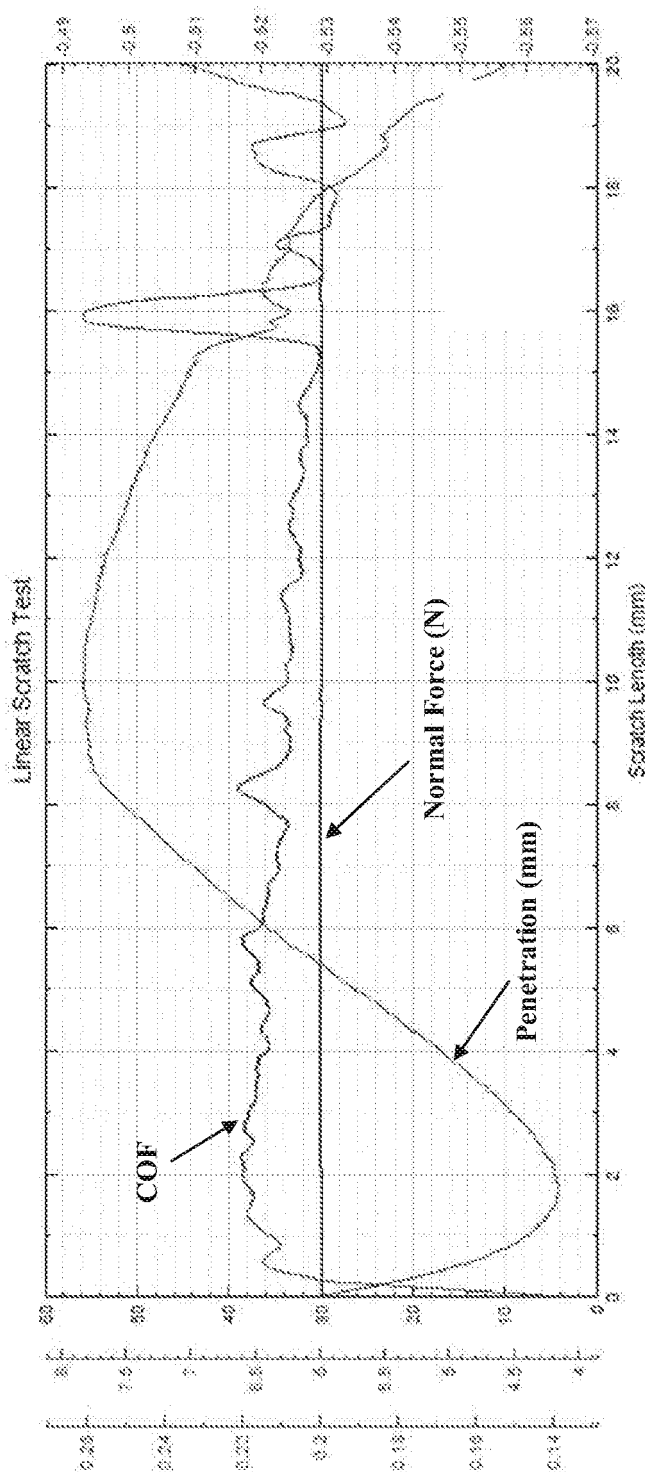


FIG. 59

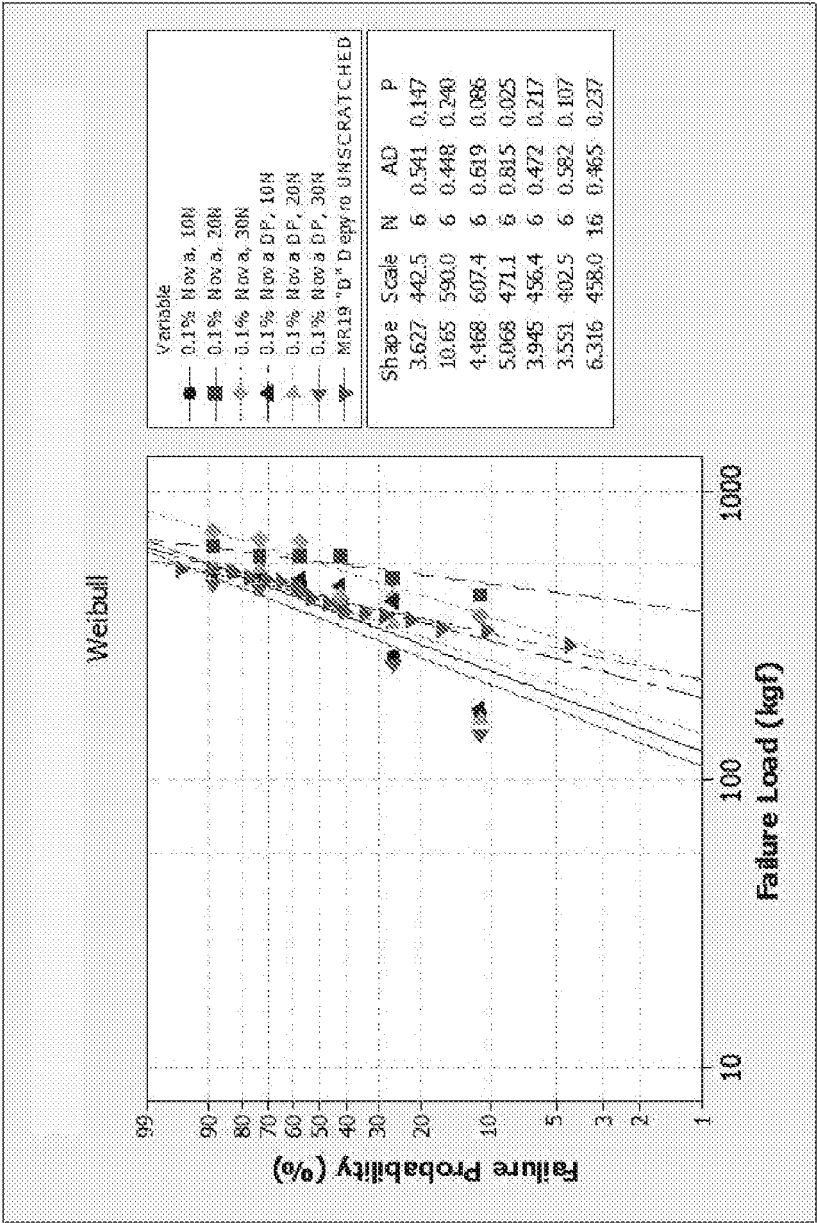


FIG. 60

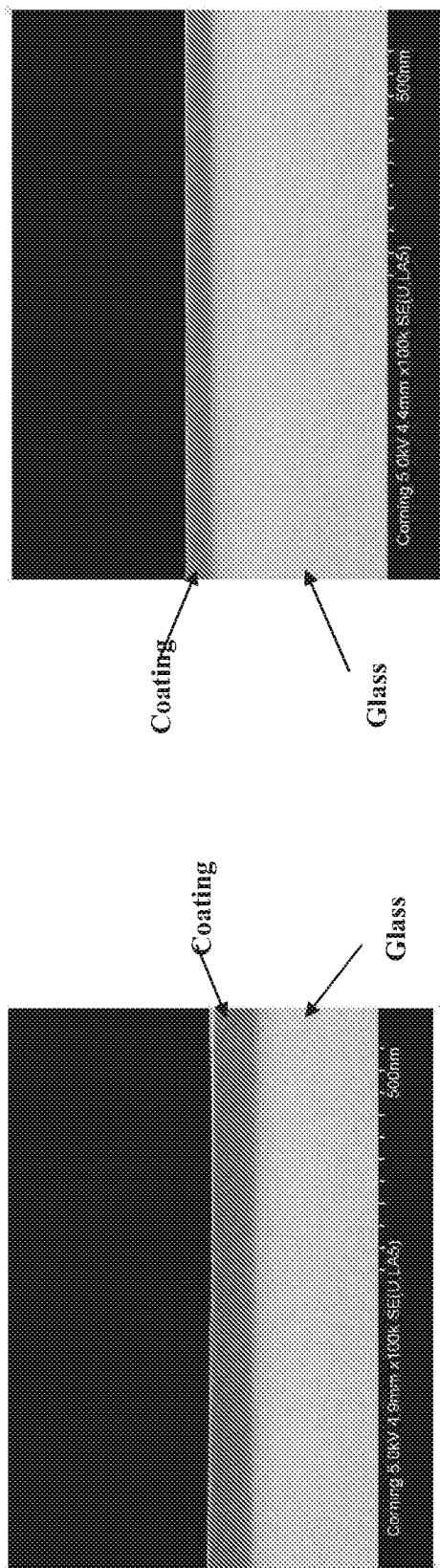


FIG. 61

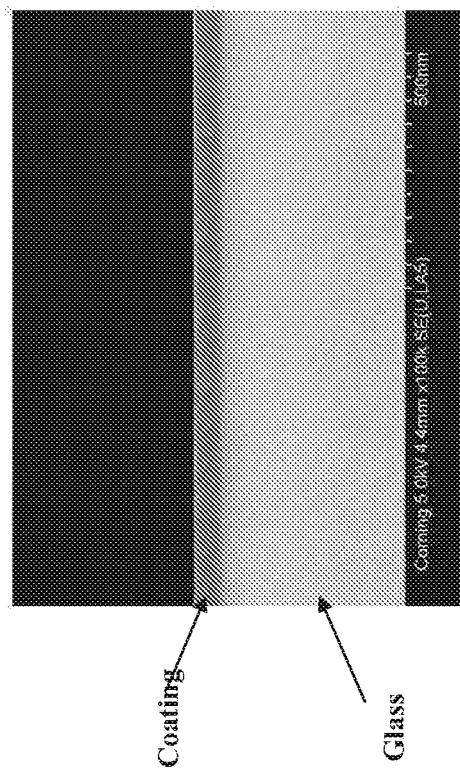


FIG. 62

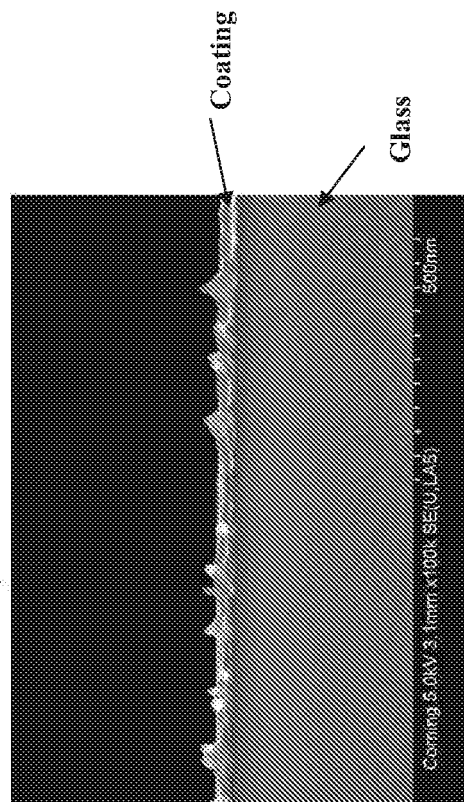


FIG. 63

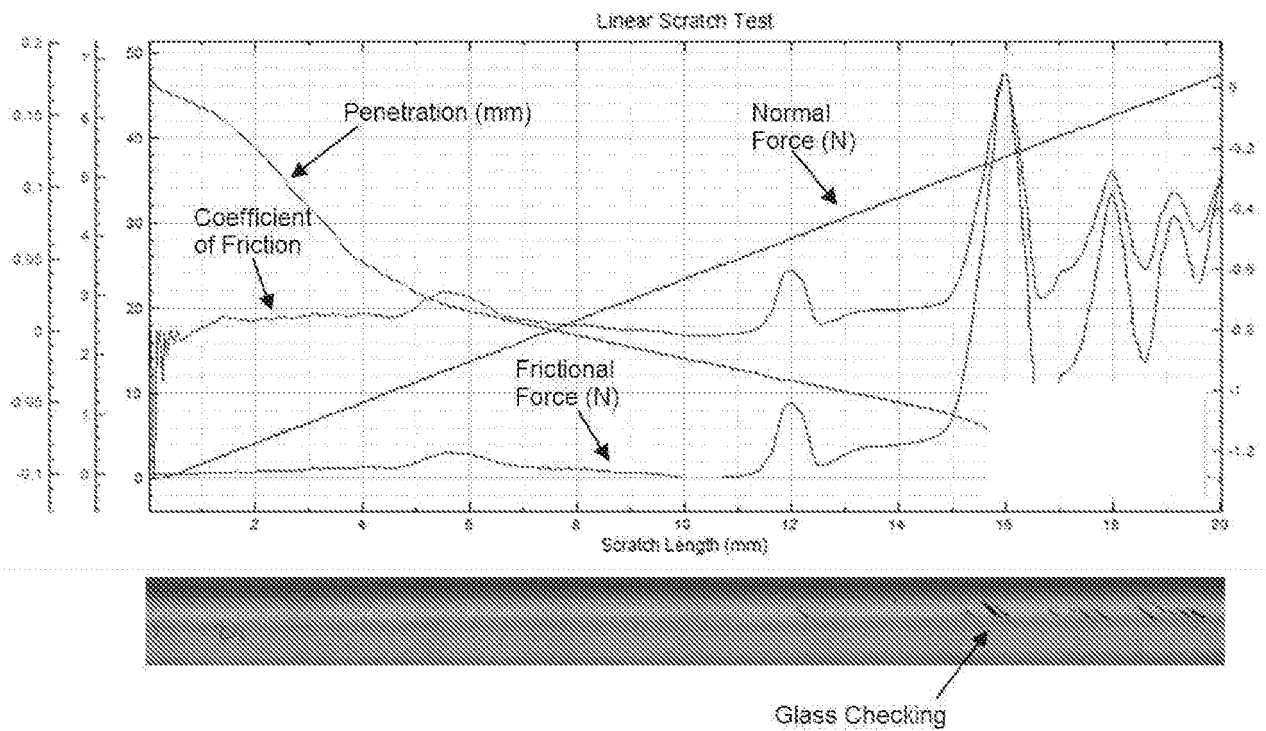


FIG. 64

58 / 60

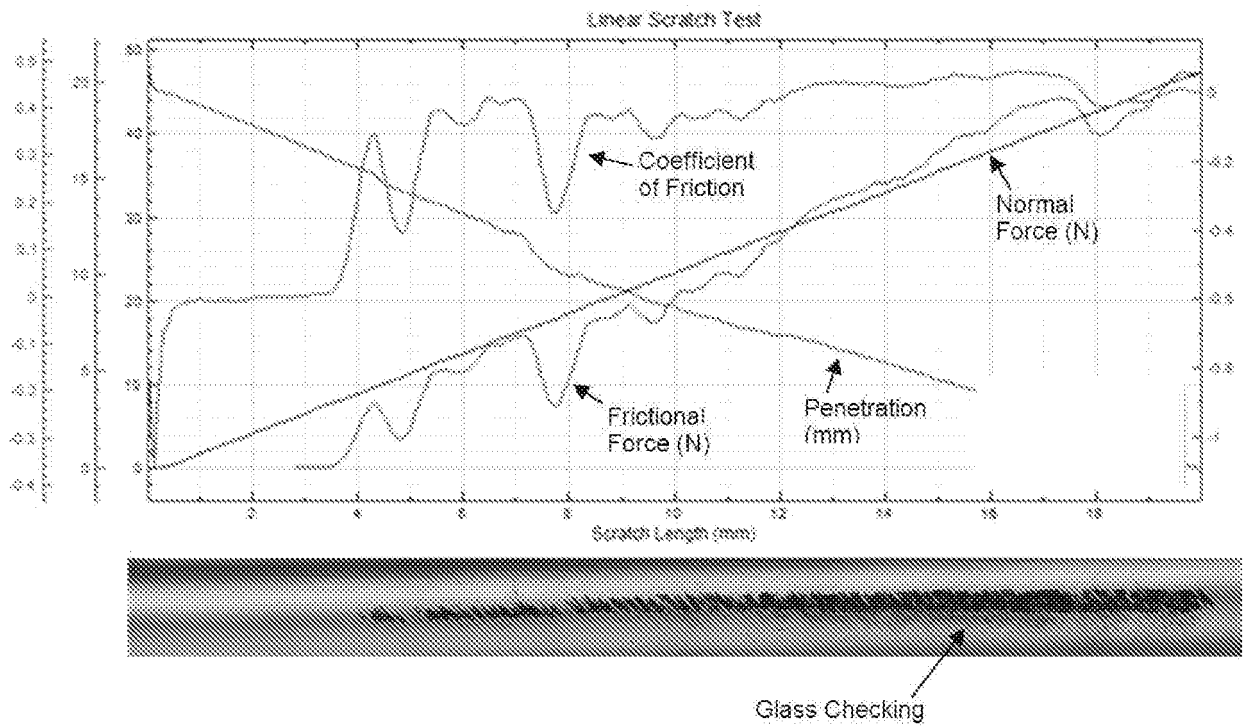


FIG. 65

59 / 60

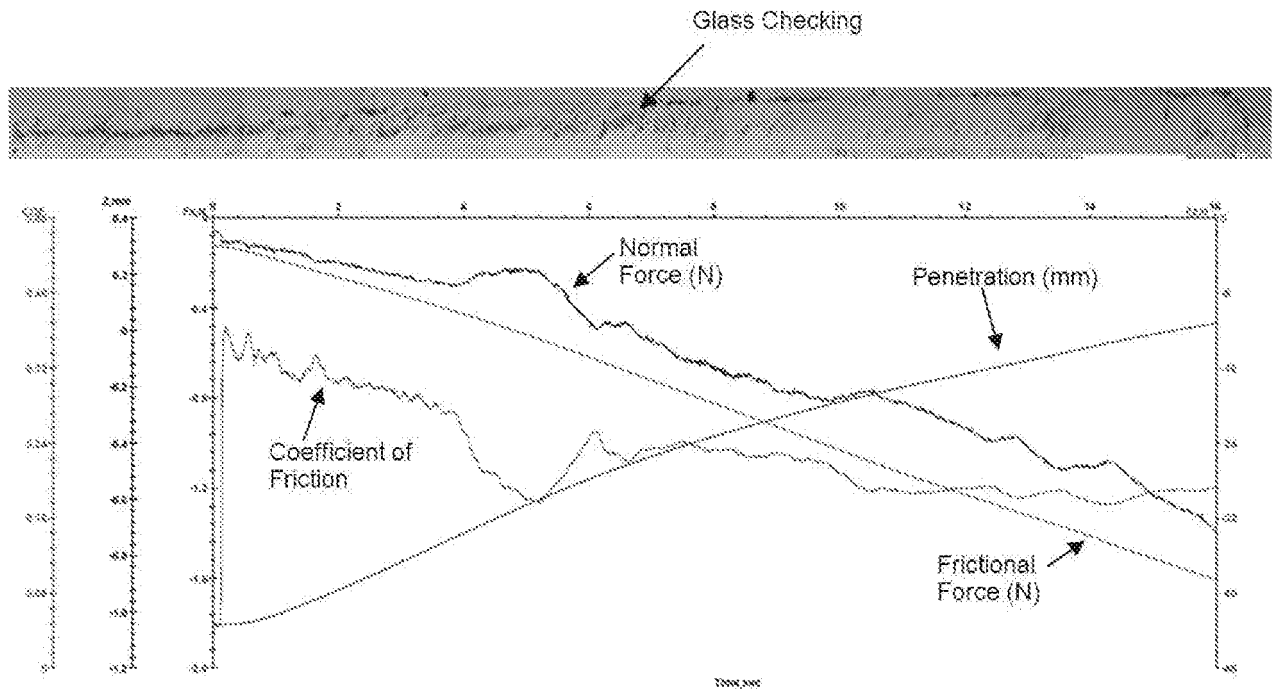


FIG. 66

60 / 60

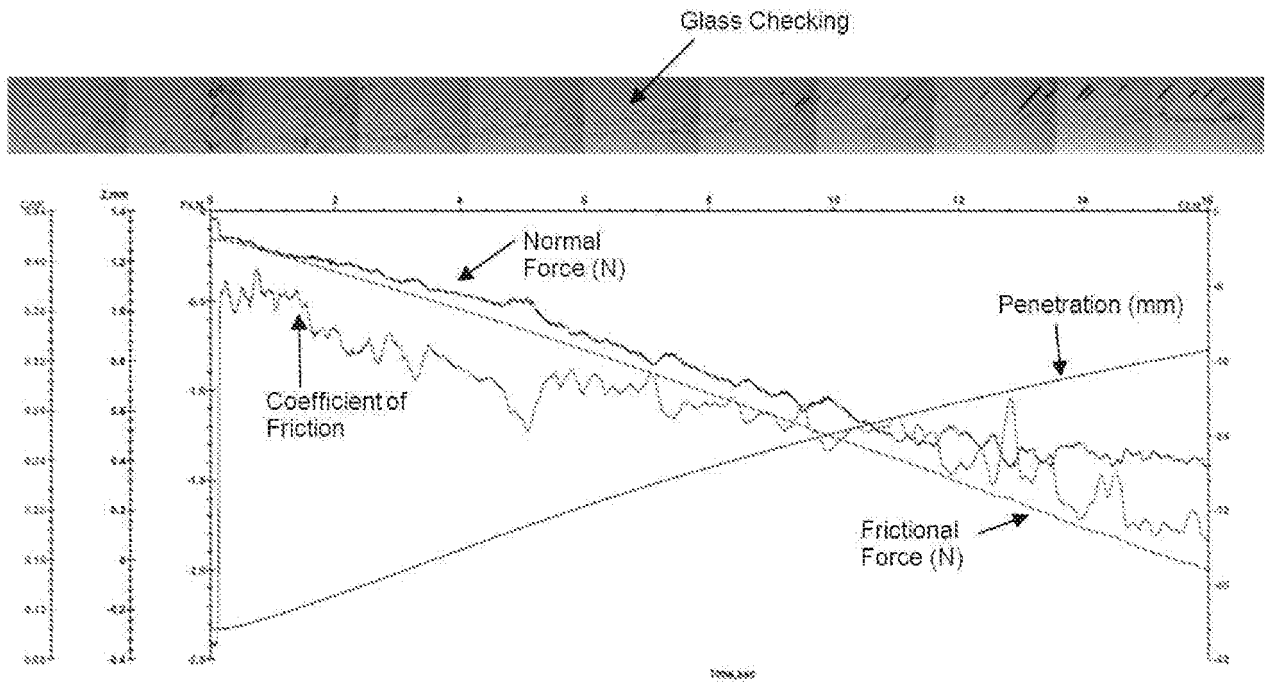


FIG. 67