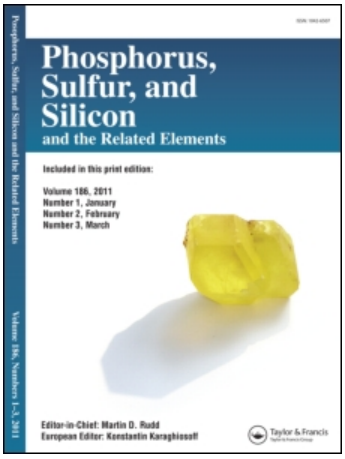


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# 2-METHYLARENO[d]-3-AZATELLUROPHENES

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# 2-METHYLARENO[d]-3-AZATELLUROPHENES

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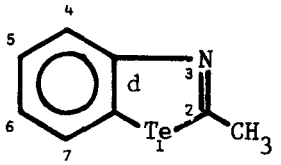
2-6-Dimethylbenzo[d]-3-azatellurophene(22%), 2-methyl-6-tert-butylbenzo[d]-3-azatellurophene (11%), 2-methyl-6-chlorobenzo[d]-3-azatellurophene (31%) and 2-methylnaphtho[2,1-d]-3- azatellurophene (13%) were prepared from 4-methylaniline, 4-tert-butylaniline, and 2-aminonaphthalene, respectively. The yields given in parentheses are overall yields based on the arylamine. For example, equimolar amounts of mercury acetate and 4-aminotoluene were refluxed in methanol for 12 hours. Lithium chloride was added to the mixture to produce 2-amino-5-methylphenyl mercury chloride. Acetylation with excess acetic anhydride gave 2-acetamido-5-methylphenyl mercury chloride in nearly quantitative yield based on aminotoluene. The aryl mercury chloride produced 2-acetamido-5-methylphenyl tellurium trichloride in 40% yield when refluxed with an equimolar amount of tellurium tetrachloride in acetic acid. Reduction with excess sodium sulfide gave bis(2-acetamido-5-methylphenyl) ditelluride in 94% yield, which was isolated and reduced further to the tellurolate with sodium borohydride in methanol/tetrahydrofuran. Addition of phosphorus trichloride to the reaction mixture yielded 2,6-dimethylbenzo[d]-3-azatellurophene in 60% yield. The compounds were characterized by their proton, C-13, and Te-125 NMR spectra.

## INTRODUCTION

Benzo[d]-3-azatellurophenes **1** are reported to form, when 2-acylamidophenyl ethyl tellurides obtained from 2-aminophenyl ethyl tellurides **2** and acyl chlorides are refluxed in phosphorus oxychloride[1]. The yields in these reactions (R = H, 2%; R = $CH_3$, 11%; R = $C_6H_5CO$, 27%; R = $C_2H_5OCO$, 13%) based on the 2-aminophenyl ethyl telluride were low. Attempts to repeat these syntheses

failed, because the starting material 2-nitrophenyl ethyl telluride could not be prepared. When 2-nitrobenzenediazonium tetrafluoroborate was reacted

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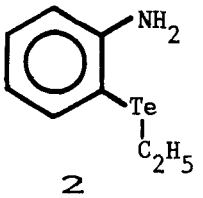


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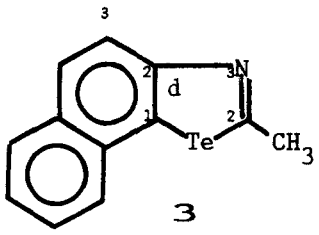
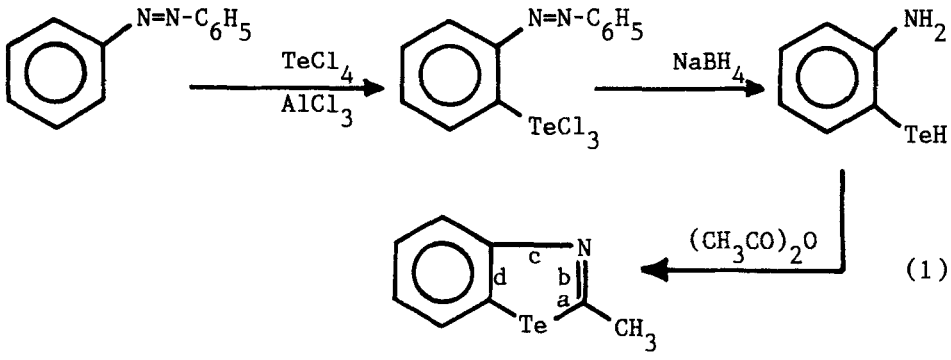



3

according to the literature procedure[2] with diethyl ditelluride in the presence of 18-crown-6, only bis(2-nitrophenyl) telluride and ditelluride and no 2-nitrophenyl ethyl telluride were isolated.

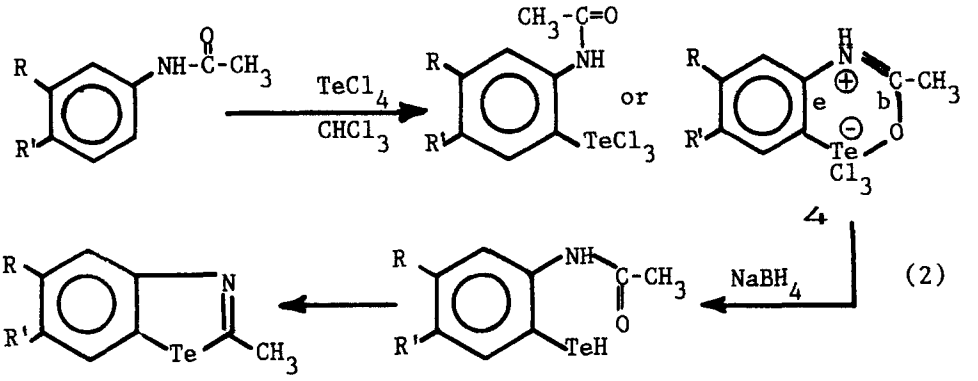
An alternative route to benzo[d]-3-azatellurophene **1** employed azobenzene as a starting material[3]. Azobenzene and tellurium tetrachloride condensed in the presence of aluminum trichloride to give 2-(phenylazo)phenyl tellurium trichloride in 63% yield. Reduction of the tellurium trichloride with sodium borohydride, treatment of the reduction product with acetic anhydride, and acidification of the reaction mixture with concentrated aqueous hydrochloric acid gave 2-methylbenzo[d]-3-azatellurophene in 41% yield (eqn. 1).



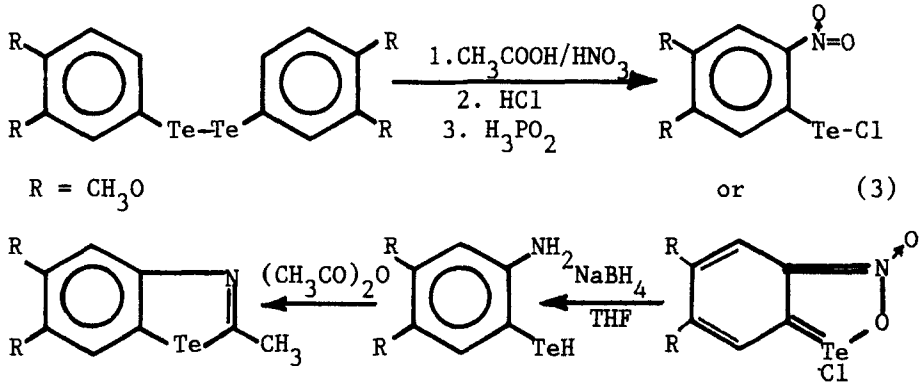

(1)

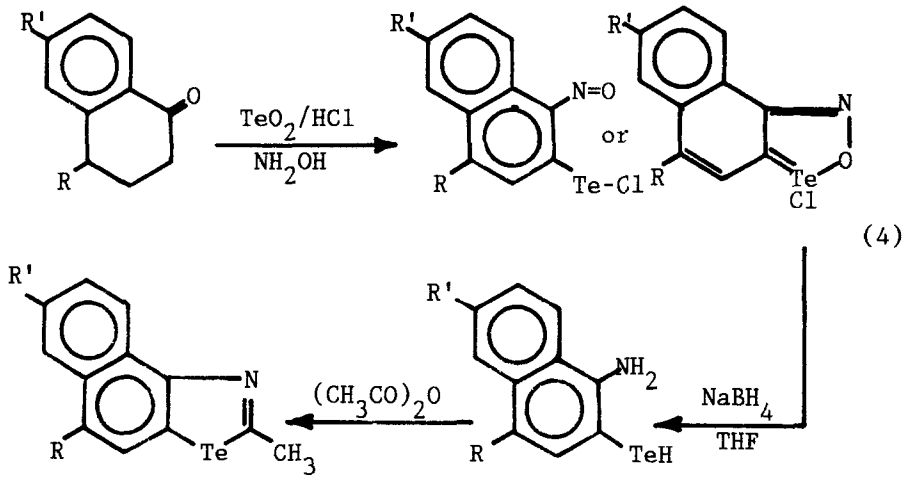
Substituted benzo[d]-3-azatellurophenes were prepared by condensation of 2-aminobenzenetellurols with acetic or propionic anhydride. The 2-amino-benzenetellurols were generated by reduction of 2-nitrophenyl tellurium

chlorides, 2-acetylaminophenyl tellurium trichlorides, or 1-nitroso-2-naphthyl tellurium chlorides with sodium borohydride.[3] These methods produce monosubstituted benzo[d]-3-azatellurophenes with the substituent in para-position to the tellurium atom (5-position in benzo[d]-3-azatellurophene) and disubstituted compounds with the substituents in para-positions with respect to tellurium and nitrogen (5,6-positions in benzo[d]-3-azatellurophene) (eqns. 2,3,4).




R, R': $CH_3$, H; $CH_3O$, H; $CH_3S$, H; OH, H; $CH_3$, $CH_3$.






This paper reports the synthesis of 2,6-dimethyl-, 2-methyl-6-tert-butyl-, and 2-methyl-6-chlorobenzo[d]-3-azatellurophenes **1** and 2-methyl-naphtho-[2,1-d]-3-azatellurophene **3** from 2-aminoaryl mercury chlorides and tellurium tetrachloride as starting materials.

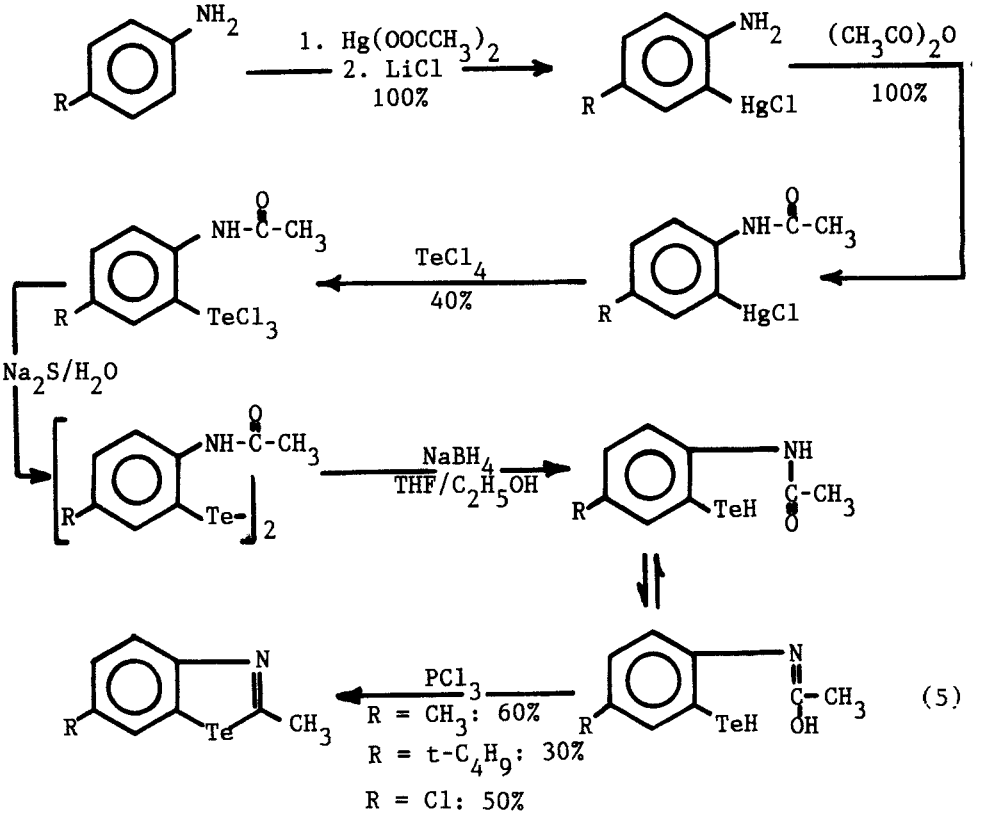
## RESULTS AND DISCUSSION

The most troublesome step in the preparation of benzo[d]-3-aza-tellurophenes is the introduction of a tellurium-containing group into an aromatic compound in ortho-position to an amino group. Attempts to prepare 2-amino-phenyl tellurium trichloride or 2-acetamidophenyl tellurium trichloride from anilines and tellurium tetrachloride in the absence or presence of catalytic amounts of mercury dichloride were unsuccessful. One of the early methods to prepare aryl tellurium trichlorides, the reaction of aryl mercury chlorides with tellurium tetrachloride,[4] produced the required tellurium-containing starting materials. The mercuration of 4-methylaniline, 4-tert-butylaniline, 4-chloro-aniline and 2-naphthylamine with mercury diacetate, treatment of the 2-amino-aryl mercury acetates with lithium chloride, and acetylation of the 2-aminoaryl

mercury chlorides with acetyl chloride to 2-acetylamidoaryl mercury chlorides proceeded quantiatively.[4] When equimolar amounts of tellurium tetrachloride and a 2-acetamidoaryl mercury chloride were refluxed in glacial acetic acid for 12 hours, 2-acetamidoaryl tellurium trichlorides were obtained in 40% yields. When dioxane was used as the reaction medium, only very small amounts of the aryl tellurium trichlorides were formed. The 2-acetamidophenyl tellurium trichlorides, off-white crystalline solids that decompose at their melting points, were shown to be 1,1,1-trichloro-3-methyl-benzo[e]-2-oxa-1-tellura-4-azolium zwitterions (**4**, eqn. 2) by single crystal x-ray investigations[5]. Crude 2-acetamido-1-naphthyl tellurium trichloride was obtained as a semisolid material.

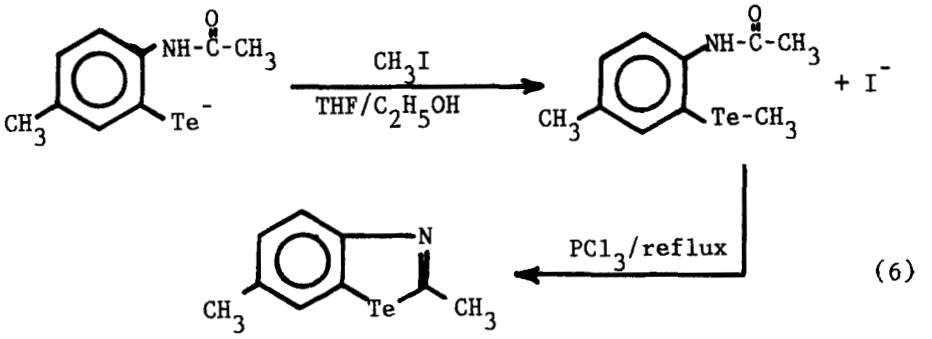
The 2-acetamidoaryl tellurium trichlorides were reduced with aqueous solutions of sodium sulfide to the corresponding ditellurides in almost quantitative yields. The crystalline, orange-red ditellurides were reduced with sodium borohydride in ethanol/THF to the arenetellurolates. Although the tellurium can be reduced with sodium borohydride directly to the tellurolates, the two-step procedure with isolation of the ditelluride gave higher and more reproducible yields. Difficulties were encountered in the cyclization of the 2-acetamidoarenetellurolates. Areno[d]-3-azatellurophenes were not formed even after prolonged heating of the tellurolates. Treatment with thionyl chloride caused extensive decomposition. However, phosphorus trichloride was found to effect ring closure to areno[d]-3-azatellurophenes in acceptable yields. The reactions proceeded at room temperature and provided the yellow crystalline areno[d]-3-azatellurophenes in 30 to 60% yields based on the ditellurides. The sequence of reactions is shown in eqn. 5. Trimethylchlorosilane used in place of phosphorus trichloride also caused cyclization, although the yields were lower (10-40%).

The reduction of the 2-acetamidophenyl tellurium trichlorides to the tellurols and their cyclization can be carried without isolation of the ditelluride. For instance, heating 5-chloro-2-acetamidophenyl tellurium trichloride in a mixture consisting of ethanol, concentrated hydrochloric acid, and hypophosphorous acid produced 6-chloro-2-methylbenzo[d]-3-azatellurophene in 50 percent yield. However, 2,6-dimethylbenzo[d]-3-azatellurophene was isolated only in 19 percent yield when this procedure was used.




Alternately, 2-acetamido-4-methylbenzenetellurolate was converted to 2-acetamido-4-methylphenyl methyl telluride upon adding methyl iodide to the tellurolate solution. The methylation proceeded quickly and quantitatively as indicated by the behavior of small samples of the reaction mixture upon exposure to air. Unreacted tellurol would immediately form the red ditelluride. No ditelluride was detected. The crude 2-acetamido-6-methylphenyl methyl telluride, obtained by evaporation of the solvent from the reaction mixture, was converted in 46% yield to 2,6-dimethylbenzo[d]-3-azatellurophene in refluxing phosphorus trichloride (eqn. 6).

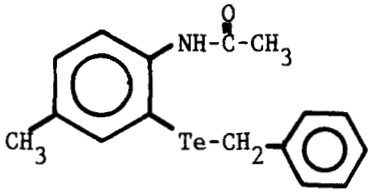
The 2,6-dimethylbenzo[d]-3-azotellurophene and the naphtho[2,1-d]-3-azotellurophene obtained from 4-methylaniline and 2-naphthylamine (eqn. 5), respectively, are isomers of the compounds obtained by Gunther[3] (eqns. 2, 4).




(6)

The 2-acetamidoaryl benzyl tellurides **5** and **6**, obtained by addition of benzyl chloride to the tellurolate solutions, are crystalline solids that – in contrast to other aryl benzyl tellurides[6] – are not affected by air and light. Thus the expected spontaneous scission of the usually weak benzyl-tellurium bond that might be followed by cyclization did not take place.



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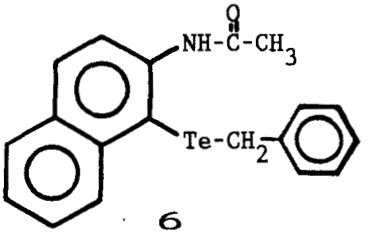
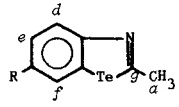
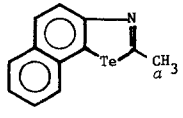
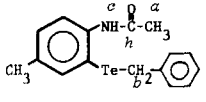
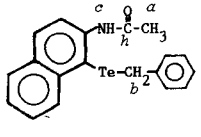
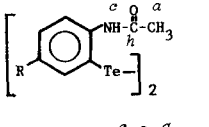
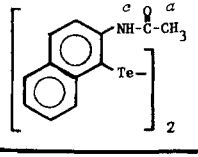



6

A comparison of the Te-125 chemical shifts of benzo[d]tellurophenes and benzo[d]azatellurophenes reveals, that tellurium in the azatellurophenes (Table 1) resonates approximately 150 ppm downfield from the tellurium in the tellurophenes[7] , as can be expected from the introduction of an element of considerable electronegativity into the 3-position. Te-125 and C-13 chemical shifts of bis(2-acetamido-5-methylphenyl) ditelluride and 2-acetamido-1-naphthyl benzyl telluride were measured to explore a possible interaction between the

TABLE I Proton, C-13, and Te-125 data for 3-azatellurophenes and related compounds.

| Compound | H-1/TMS(int) | C-13/$CDCl_3$/TMS(int) | Te-125/$CDCl_3$* |
|---|---|---|---|
|  | R = $CH_3$: a 2.82(s); d 7.90(d); e 7.18(d of d); f 7.60(d); R 2.40(s). | a 20.9; g 168.4; R 30.4; arom.: 124.7, 127.8, 131.5, 134.5, 135.5, 158.5. | 891 |
| | R=$(CH_3)_3C$: a 2.82(s); d 7.95(d); e 7.44(d of d); f 7.84(d); R 1.33(s). | | – |
| | R = Cl: a 2.81(s); d 7.92(d); e 7.36(d of d); f 7.76(d). Solvent: $CDCl_3$ | a 38.9; g 142.7; arom.: 127.1, 128.6, 131.7, 132.3, 137.9. | 945 |
|  | Solvent: $CDCl_3$ a 2.48(s) arom.: 7.18 - 8.12(m) | —— | 900 |
|  | Solvent: $CDCl_3$ a 2.28(s); b 4.00(s); c not detected; $CH_3$ 1.81(s); arom.: 6.90 - 8.15(m). | —— | – |
|  | Solvent: $CDCl_3$ a 2.00(s); b 3.91(s); c not detected; arom.: 6.70 - 8.51(m). | a 24.6; b 12.7; h 169.1; arom.: 108.8 - 142.1 | 278 |
|  | R = $CH_3$: Solvent: $CDCl_3$ a 1.84(s); c 7.49(s); R 2.21(s); d 7.83(d); e 7.13(d of d); f 7.65(d). | a 20.5; h 170.9; R 23.7; arom.: 105.7, 120.2, 131.1, 135.8, 137.8, 142.2. | 333 |
| | R=$(CH_3)_3C$: Solvent: $CDCl_3$ a 1.86(s); c 8.10(s); R 1.14(s); arom.: 7.14 - 7.90(m). | —— | – |
|  | Solvent: $CF_3COOH$ a 1.43(s); c 8.06(s); arom.: 6.60 - 7.60(m). | —— | – |

*$(CH_3)_2Te$(int)

tellurium atom and the amide carbonyl functionality. However, the values found are well within the typical ranges for such compounds and do not indicate any interaction. The proton shifts of 2-methylareno[d]-3-azatellurophenes are remarkably similar to those of the corresponding thiophenes[8] usually not differing by more than 0.2 ppm for equivalent protons. Mass spectra of 2-methylareno[d]-3-azatellurophenes display a strong molecular ion peak and a second characteristic fragment (M-41) formed by loss of methyl cyanide.

## EXPERIMENTAL

### Materials and Instrumentation

Methylene chloride and ethanol were purchased from Central Texas Chemical Co. Tellurium tetrachloride was prepared from the elements. All other chemicals were purchased from Aldrich and used as received. Proton NMR spectra of intermediates and products were recorded on a Varian EM 390 spectrometer, selected C-13 and Te-125 spectra on a Varian FT 80 spectrometer. Elemental analyses were performed by Galbraith Laboratories.



### 2-Acetamido-5-methylphenyl mercury chloride

4-Aminotoluene (33.6 g, 0.31 mol), mercury diacetate (100 g, 0.31 mol) and methanol (400 mL) were refluxed for 12 hrs in a 1-L, round-bottomed flask equipped with a reflux condenser, a magnetic stirrer, and a heating mantle. A solution of lithium chloride (14 g, 0.33 mol) in 50 mL methanol was added. The heating mantle was removed. The mixture was stirred for 1 hr and allowed to cool to room temperature. 2-Amino-5-methylphenyl mercury chloride crystallized. The crystals were collected on a Buchner funnel and dried under an oil pump vacuum at 50°. The dry 2-aminophenyl mercury chloride was placed in a 500 mL beaker. Sufficient acetic anhydride was added to cover the solid completely (150 mL). The beaker was covered and set aside. After 2-3 minutes the mixture warmed spontaneously. The reaction was allowed to proceed for 5 hrs. Then dichloromethane (100 mL) was added. The solid product was collected by filtration, washed with dichloromethane (100 ml), and dried under an oil pump vacuum at 50°. Yield: 113.3 g (94%), mp. > 250°.

**2-Acetamidoaryl mercury chlorides**

2-Aminonaphthalene (22.5 g, 0.16 mol) was similarly converted to 2-acetamido-1-naphthyl mercury chloride using 51 g (0.16 mol) mercury acetate. Yield: 64.8g (98%); mp. >250°.

Likewise, 4-tert-butylaniline (11.7 g, 78 mmol) produced 2-acetamido-5-tert-butylphenyl mercury chloride. Yield: 33.8 g (95%); mp 220°(dec.).

4-Chloroaniline (20 g, 0.16 mol) and mercury acetate (50 g, 0.16 mol) gave similarly 2-acetamido-5-chlorophenyl mercury chloride. Yield: 59.0 g (95%); mp. > 250°.

**2-Acetamido-5-methylphenyl tellurium trichloride**

2-Acetamido-5-methylphenyl mercury chloride (20.0 g, 52 mmol), tellurium tetrachloride (14.0 g, 52 mmol) and glacial acetic acid (300 mL) were placed into a 1-L, round-bottomed flask equipped with a magnetic stirrer, a reflux condenser, and a drying tube (calcium chloride). The mixture was refluxed (heating mantle) for 12 hrs. Boiling glacial acetic acid (150 mL) was then added. The hot mixture was filtered and the filtrate cooled. 2-Acetamido-5-methylphenyl tellurium trichloride crystallized and was collected on a Buchner funnel. The compound was pure enough for the next step. An analytical sample was obtained by recrystallization from acetic acid. Yield: 8.0 g (40%); mp. 260°(dec).

Anal. for $C_9H_{10}Cl_3NOTe$ (382.15) found (calc.): C 28.31 (28.28), H 2.38 (2.64).

**2-Acetamido-5-tert-butylphenyl tellurium trichloride**

2-Acetamido-5-tert-butylphenyl mercury chloride (11.0 g, 25.7 mmol) and tellurium tetrachloride (6.3 g, 25.7 mmol) produced similarly off-white crystals of 2-acetamido-5-tert-butylphenyl tellurium trichloride. Yield: 4.4 g (40%); mp. 260°(dec).

Anal. for $C_{12}H_{16}Cl_3NOTe$ (424.23) found (calc.): C 33.80 (33.97), H 3.35 (3.80).

**2-Acetamido-1-naphthyl tellurium trichloride**

2-Acetamido-1-naphthyl mercury chloride (13.7 g, 32.6 mmol) and tellurium tetrachloride (8.8 g, 32.6 mmol) were refluxed in 300 mL glacial acetic

acid for 12 hrs. The solvent was removed by heating the mixture under an aspirator vacuum. The semisolid residue was used without purification. Attempts to crystallize the compound from acetic acid failed.

**2-Acetamido-5-chlorophenyl tellurium trichloride**

2-Acetamido-5-chlorophenyl mercury chloride (15.0 g, 37 mmol), tellurium tetrachloride (10.0 g, 37 mmol), and glacial acetic acid were refluxed for 12 hrs. The hot mixture was filtered and the filtrate concentrated to 60 mL under an aspiration vacuum at 70°. The product that crystallized upon cooling (10.8 g, 67%) was used without purification.

Anal. for $C_8H_9Cl_4NOTe$ (402.56) found(calc.):C 23.10 (23.87), H 1.40 (1.75).

**Bis(2-acetamido-5-methylphenyl) ditelluride**

2-Acetamido-5-methylphenyl tellurium trichloride (8.0 g, 21 mmol) and chloroform (300 mL) were placed into a 1-L Erlenmeyer flask. A solution of sodium sulfide nonahydrate (20.0 g, 83 mmol) in water (50 mL) was added. The mixture was stirred for 5 hrs at room temperature. The orange chloroform layer was separated, dried over anhydrous sodium sulfate, and filtered. The filtrate was evaporated to dryness under an aspirator vacuum on a water bath (60°). The residue was triturated with 95% ethanol (50 mL). The mixture was filtered through a Buchner funnel to collect the ditelluride. Yield: 5.4 g (94%); mp. 181-183°.

Anal. for $C_{18}H_{20}N_2O_2Te_2$ (551.57) found (calc.): C 38.63 (39.19), H 3.87 (3.65).

**Bis(2-acetamido-5-tert-butylphenyl) ditelluride**

2-Acetamido-5-tert-butylphenyl tellurium trichloride (4.0 g, 9.4 mmol) and chloroform (150 mL) were placed into a 1-L Erlenmeyer flask. A solution of sodium sulfide nonahydrate (10.0 g, 41 mmol), in water (25 mL) was added. The reaction mixture was treated as described above. The residue solidified to an orange foam that could not be crystallized from ethanol.

Anal. for $C_{24}H_{32}N_2O_2Te_2$ (635.37) found (calc.): C 42.54 (45.34), H 5.29 (5.08).

### Bis(2-acetamido-l-naphthyl) ditelluride

Crude 2-Acetamido-l-naphthyl tellurium trichloride, obtained from 2-acetamido-l-naphthyl mercury chloride (13.7 g, 32.6 mmol) and tellurium tetrachloride (8.8 g, 32.6 mmol), and chloroform (900 mL) were placed into a 1-L Erlenmeyer flask. A solution of sodium sulfide nonahydrate (40 g, 0.17 mmol) in water (100 mL) was added. The reaction mixture was treated as described above. Yield: 4.37 g (43%, based on tellurium tetrachloride); mp. 240°(dec.).
Anal. for $C_{24}H_{20}N_2O_2Te_2$ (623.64) found (calc.): C 46.34 (46.22), H 3.51 (3.23).

### 2,6-Dimethylbenzo[d]-3-azatellurophene

Bis(2-acetamido-5-methylphenyl) ditelluride (6.0 g, ll mmol) was placed into a 100-mL round-bottomed flask equipped with a magnetic stirring bar. Absolute ethanol (8 mL) and dry tetrahydrofuran (50 mL) were added. The flask was purged with nitrogen. Small portions of sodium borohydride were added to the stirred mixture until the red color of the ditelluride had faded. The mixture was cooled in an ice/water bath. Phosphorus trichloride (20 mL, 0.22 mol) was added to the cold mixture in one portion. The flask and its contents were allowed to warm to room temperature. The reaction mixture was then poured into water (200 mL). Solid sodium carbonate was added, until the solution had become neutral. After addition of sodium thiosulfate (2.0 g) the mixture was extracted with two 50-mL portions of dichloromethane. The extracts were combined, dried over anhydrous magnesium sulfate, and filtered. The filtrate was evaporated to dryness under an aspirator vacuum on a 60° water bath. The yellow, oily residue solidified on standing. The compound was purified in a vacuum sublimator (20 Torr, 120°). Yield: 3.5 g (61%); mp. 67-69°.
Anal. for $C_9H_9NTe$ (258.77) found (calc.): C 41.79 (41.77), H 3.56 (3.51).

### 2-Methyl-6-tert-butylbenzo[d]-3-azatellurophene

Bis(2-acetamido-5-tert-butylphenyl) ditelluride (0.50 g, 0.79 mmol) in ethanol (2 mL)/tetrahydrofuran (10 mL) was reduced with sodium borohydride. The cold mixture was treated with phosphorus trichloride (4 mL, 44 mmol) and worked up as described above. Yield: 0.19 g (41%); mp. 65-68°.
Anal. for $C_{12}H_{15}NTe$ (300.86) found (calc.): C 47.95 (47.90), H 6.02 (5.02).

**2-Methylnaphtho[2,1-d]-3-azatellurophene**

Bis(2-acetamido-1-naphthyl) ditelluride (2.0 g, 3.22 mmol) in ethanol (3 mL)/tetrahydrofuran (20 mL) was treated in sequence with sodium borohydride and phosphorus trichloride (8 mL, 88 mmol) and worked up as described above. Yield: 0.57 g (30%); mp. 52-54°.
Anal. for $C_{12}H_9NTe$ (294.80) found (calc.): C 48.79 (48.98), H 2.97 (3.08).

**6-Chloro-2-methylbenzo[d]-3-azatellurophene**

5-Chloro-2-acetamidophenyl tellurium trichloride (10.8 g, 27 mmol), 95% ethanol (100 mL), conc. hydrochloric acid (25 mL), and 50% hypophosphorous acid (10 mL) were placed into a 250 mL, round-bottomed flask equipped with a magnetic stirrer, a reflux condenser, and a heating mantle. The well-stirred mixture upon gentle heating became viscous. Close to the boiling point the mixture turned black and became fluid again. After a few minutes at reflux the hot mixture was filtered, and the filtrate concentrated to 30 mL at 70° under an aspirator vacuum. 6-Chloro-2-methylbenzo[d]-3-azatellurophene hydrochloride crystallized upon cooling. Yield: 4.1 g (50%); dec. > 150°. The hydrochloride was shaken with an excess of an aqueous sodium carbonate solution. The aqueous phase was extracted with chloroform. The extract was allowed to evaporate at room temperature. The crystalline material is analytically pure. Yield: 3.5 g (97%); mp. 116°.
Anal. for $C_8H_6ClNTe$ (279.19) found (calc.): C 34.20 (34.42), H 2.12 (2.17).



**Attempt to thermally cyclize 2-acetamidoarenetellurolates**

The tellurolates were prepared in situ as described above. The reaction mixtures were gently refluxed under nitrogen. Samples taken after 2, 6, and 12 hours were instantly oxidized to the ditellurides when exposed to air indicating that azatellurophenes had not formed.

**2,6-Dimethylbenzo[d]-3-azatellurophene from 2-acetamido-5-methylphenyl methyl telluride**

Bis(2-acetamido-5-methylphenyl) ditelluride (3.0 g, 5.5 mmol) was

dissolved in absolute ethanol (4 mL)/tetrahydrofuran (25 mL) and reduced with sodium borohydride as described. When the color of the ditelluride had faded, methyl iodide (22 g, 77 mmol) was added. The solvent was removed by heating the mixture on a 60° water bath under an aspirator vacuum. Phosphorus trichloride (10 mL) was poured to the residue. The mixture was gently refluxed (oil bath) for 3 hrs. The reaction mixture was worked up as described. Yield 1.3 g (46%); mp. 69°.

**2-Acetamido-5-methylphenyl benzyl telluride**

Bis(2-acetamido-5-methylphenyl) ditelluride (3.0 g, 5.5 mmol) was reduced with sodium borohydride as described above. Benzyl chloride (1.04 g, 8.25 mmol) was added to the tellurolate solution. The mixture was stirred for a few minutes, and then poured into water (200 mL). The aqueous solution was extracted with two 50-mL portions of dichloromethane. The extracts were combined, dried over anhydrous magnesium sulfate, and filtered. The filtrate was evaporated to dryness on a water bath (60°) under an aspirator vacuum. The residue was recrystallized from 95% ethanol. Yield: 0.59 g (44%); mp. 65-67°.
Anal. for $C_{16}H_{17}NOTe$ (366.92) found (calc.): C 52.54 (52.38), H 4.78 (4.67).



**2-Acetamido-1-naphthyl benzyl telluride**

Bis(2-acetamido-1-naphthyl) ditelluride (2 g, 3.2 mmol) was reduced, alkylated with benzyl chloride (1.22 g, 9.63 mmol), and the mixture worked up as described above. Yield: 1.7 g (65%); mp. 99°.
Anal. for $C_{19}H_{17}NOTe$ (402.95) found (calc.): C 56.36 (56.63), H 4.05 (4.25).

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